INKS LAKE STATE PARK

HIKING TRAIL GUIDE

FOR

Pecan Flats

TEXAS PARKS & WILDLIFE

Life's better outside.®

ACKNOWLEDGMENTS

This trail guide was developed as a class project by the 2013 class of the Highland Lakes Chapter of the Texas Master Naturalist program. We want to express our appreciation to the many individuals and organizations that made this project possible.

First, we thank the Texas A&M AgriLife Extension Service and the Texas Parks and Wildlife Department for creating the Texas Master Naturalist program.

This project would not have been possible without the support of the staff of Inks Lake State Park including Terry Rodgers, Sean Jones, Terry Young, and many other staff members who contributed their help and expertise throughout the project.

We appreciate the financial support provided by the Highland Lakes Master Naturalist Chapter, Linda O'Nan, President, and the Friends of Inks Lake State Park, Craig Davidson, President.

This project builds on a previous interpretive guide titled *Inks Lake State Park Hiking Trail Guide for Pecan Flats* developed by Sarah Fryar in 2005.

We offer a special note of appreciation to Betty Cruikshank, the coordinator extraordinaire of the 2013 Highland Lakes Master Naturalist class; Jerry Stacy, who personifies the ideal of the Texas Master Naturalist; and the many other Master Naturalists who contributed to the Highland Lakes Master Naturalist class of 2013.

Thank you.

Photographs by Susan Downey

INTRODUCTION

Welcome to the Inks Lake State Park Pecan Flats Trail! This guide is coordinated with numbered sign posts along the trail through the Pecan Flats primitive camping area. From the trailhead near the Park Headquarters (located at the entrance station), the trail winds for three miles through cedar, pecan and hardwood forests, along riparian and upland natural areas and up to scenic viewpoints over Inks Lake and adjoining landmarks.

The entire trail is 3.3 miles long and can be completed at a moderate pace in under three hours. The first sections of the trail are easy to follow and well maintained. The best views are on the final portion of the trail. This part of the trail has some narrow stretches and a modest amount of elevation gain.

There are no sources of water on the trail, so please take water with you. Composting toilets can be found in the Pecan Flats Campground area about halfway along the trail.

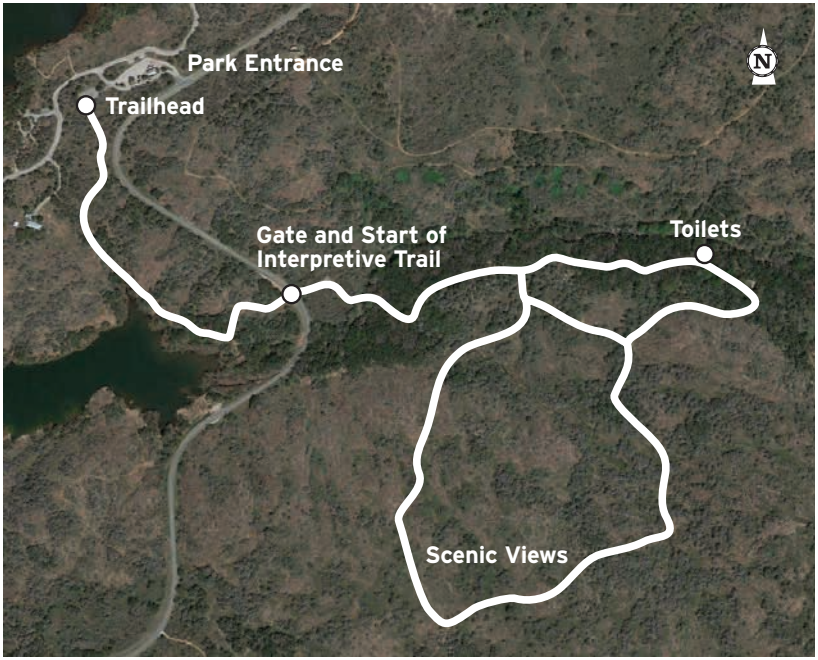
Inks Lake State Park

Inks Lake State Park comprises 1,200 acres (almost two square miles) of rolling hills of granite and gneiss rock. It has abundant populations of white-tailed deer and borders the pristine Inks Lake. Land for the park was officially set aside in 1939, but was not open to the public until 1950. It is among the most popular state parks in Texas.

Pecan Flats Trail Guide

This trail guide was created to share many interesting aspects of the park and to help you become more familiar with the Hill Country, some of its native trees and shrubs, and other natural phenomena. We hope you enjoy your stay and come back soon.

This guide is organized around 28 numbered trail markers. From the trailhead adjacent to the Park Headquarters (located at the entrance station), follow the green trail about a quarter of a mile to the “Interpretive Trail” sign marking the beginning of the yellow trail to the left. Continue on the yellow trail another quarter of a mile until you cross Park Road 4 at the gate to the Pecan Flats Primitive Camping Area. The trail markers begin on the left side of the path just past the gate.



SAFETY AND TRAIL ETIQUETTE

Thanks for following these best practices to ensure your safety and responsible care of the park.

- Know your limits. Prepare for sun and heat. Wear sunscreen and appropriate clothing/hiking shoes.
- Take plenty of water. Bring a quart of water per hour of activity.
- Stay on the trail for your protection as well as the park's resources.
- Take only memories and pictures. Please don't disturb or remove any of the park's plants, animals or artifacts.
- Keep pets on leashes to keep them safe while protecting wildlife.
- Trash your trash. Pack out all of your trash and Leave No Trace.
- Please note that while plants' edible uses are mentioned, you are not allowed to collect plants.

Note: During some times of the year, especially in November and December, the Pecan Flats area is closed due to public hunting. Confirm with park headquarters staff that the trail is open.

PECAN FLATS INTERPRETIVE TRAIL GUIDE
CONTENTS

MESQUITE

Prosopis glandulosa Torr.

TRAIL MARKER: 1

N 30° 44' 2.1" W 098° 21' 57.2"

The majestic mesquite tree is a survivor as it can withstand drought and other severe weather. Since mesquite is such a hardy plant, it makes for a great pioneer species, meaning it can grow where other species cannot. It is well adapted to dry climates with tap-roots reaching depths of 40 feet, heights reaching up to 20 feet, and thorns approximately one inch in length along the branches. In the Edwards Plateau region of Central Texas, mesquite often grows in the same area as Ashe juniper, Texas persimmon, live oak, threeawns, sideoats grama and sedges. It is also associated with xeric species (species that prefer dry habitats) such as catclaw.

Its seed pods have been used as food for humans, deer and other animals.

The word "mesquite" is a Spanish adaptation of the Aztec word *mizqitl*, meaning "tree." Mesquite is commonly referred to as honey mesquite or western honey mesquite. Texas-style barbecue is often cooked over mesquite, but there are many uses for mesquite other than barbecue. Mesquite produces pods, or beans as they are commonly referred to by the locals. The beans are sweet and can be eaten when cooked correctly. Native Americans ground up dried mesquite pods to make flour for breads and cakes. Native Americans also used the leaves, bark, and roots for eye treatments and to cure problems with the stomach and the skin. The gum that oozed from the trunk was probably the part most used for medicinal purposes. Darker sap was used to make black dye, and clear sap was used for making candy.

Mesquite provides a great habitat for many different wildlife species, including the white-tailed deer found throughout the park.

MISTLETOE

Phoradendron tomentosum

TRAIL MARKER: 2

N 30° 44' 2.5" W 098° 21' 56.5"

At the previous trail marker, you saw a mesquite tree. Here is another mesquite tree, but what is different about this one? If you look high in this mesquite tree, you will see an example of mistletoe.

Mistletoe is a favorite around the holiday season. Not only is it a pretty decoration, but as tradition goes, the custom of exchanging kisses under the mistletoe creates an opportune time to get that holiday kiss from your sweetheart.

Archeologists have found fossil pollen records that show that mistletoe has been in existence for millions of years. Mistletoe is considered to be a semi-parasite. Even though it obtains most of its nutrients from its host tree, it does have green leaves, which indicate that it performs photosynthesis.

Long ago, people noticed that wherever birds left their droppings, mistletoe would appear. This is where its common name comes from. *Mistle* is an Anglo-Saxon word for "dung" and *toe* means "twig;" thus, mistletoe means dung-on-a-twig. Mistletoe is also called witch's broom and "basket on high."

The berries of mistletoe are quite toxic to people, but to wild animals such as squirrel or deer, the berries are a divine feast rich in protein. Mistletoe also provides a great habitat for many species of wildlife.

BEE BUSH and HACKBERRY

TRAIL MARKER: 3

N 30° 44' 1.3" W 098° 21' 55"

Just to the right of this trail marker, you will see bee bush, which is a shrub, and directly behind the marker is a small hackberry tree.

BEE BUSH

Aloysia gratissima

Bee bush is a perennial shrub that reaches a height of about 10 feet and is a member of the verbena family. It produces clusters of white, vanilla-scented flowers. These flowers grow in spikes and extend above the one-inch-long leaves. They appear between March and November, depending upon the amount of rainfall, and are loved by bees.

This fragrant, slender shrub has a light gray bark. It grows in various types of soil from moist loams to caliche. It will grow in partial shade but blooms most prolifically in full sun. Bee bush can be pruned as a hedge for privacy. This lovely native shrub is also valued as browse for wildlife.

HACKBERRY

Celtis Sp.

The name “hackberry” originated from the Scottish word *hagberry*, meaning “bird cherry.” This misunderstood tree can grow up to 100 feet in height and is extremely drought-resistant. Some consider it unattractive with its appearance of wart-like growths, leathery leaves and frequent limb shedding. Many people claim to suffer from seasonal allergies from the pollen the tree produces. For these reasons, many traditional landscapers do not list it as a desirable plant.

However, this is one of the most valuable trees to wildlife. The fruit is known to be consumed by at least 25 species of birds including wild turkeys. The fruit is round to oval and emerges as orange-red turning to deep purple. The flesh is thin, yellow, sweet, and very desirable. The fruit was eaten by Native Americans.

Other names for hackberry trees are one-berry, false-elm, hoop-ash, and nettle-tree. Some commercial uses for the wood include pallets, furniture, and sporting goods.

CEDAR ELM

Ulmus crassifolia

TRAIL MARKER: 4

N 30° 44' 1.5" W 098° 21' 53.8"

The cedar elm is another tree that is abundant at Inks Lake State Park. It loves the rocky, poorly drained, and compacted soils prevalent in some parts of Central Texas and may reach 90 feet in height. Cedar elm leaves are small and shiny green with serrated or jagged edges and are thicker than other elm leaves. In the fall, the many small leaves turn a bright gold, but as they begin to fall, they do not contribute significantly to leaf litter because they decompose very rapidly. Cedar elms are hardy and well-adapted to the Central Texas environment, and are considered to be a deer-resistant tree.

BLACK WILLOW

Salix nigra

TRAIL MARKER: 5

N 30° 44' 1.5" W 098° 21' 53.6"

You are now entering a riparian zone, which is an area between land and a river or stream. In riparian zones, you'll find plant species that are identified with water, such as the black willow, sycamore trees and various forbs and grasses.

The black willow is a medium-sized deciduous tree that typically grows up to 50 feet tall with a trunk up to three feet in diameter. It is typically found in swamps and near riverbeds, therefore earning it the nickname of "swamp willow." The large trunks and roots help prevent erosion in these areas. The black willow grows in clumps along these water courses in the southwestern United States and in parts of Mexico.

In the spring, the tree produces flower clusters called catkins, similar to those of the live oak. These yellow blooms grow about one to two inches in length and have soft, dense hairs. The wood of the tree is weak, soft, and reddish to pale brown in color. The fruit of the tree is a small capsule that can be broken open revealing numerous, small down-covered seeds. The leaves turn a beautiful bright yellow in the fall.

Historical uses include a quinine substitute made from the roots. The bark contains the chemical compound salicylic acid and was used as an aspirin substitute to treat fevers and coughs. Native Americans used parts of the tree for baskets and mat making. Today, weavers treat the bark with a method that produces a peach color in natural fabrics.

WAFER ASH

Ptelea trifoliata

TRAIL MARKER: 6

N 30° 44' 1.1" W 098° 21' 53"

This valuable native North American tree is also known as the hop-tree, potato-chip tree, quinine tree, and the stinking ash, to name a few. The genus name *Ptelea* is the classical name for elm, and trifoliate means three leaflets. The wafer ash is the northernmost member of the rue or citrus family.

The wafer ash is often a large rounded shrub, but it can grow to a tree of 25 feet in height. It makes a great understory or cover tree for small mammals. It is often found in full sun to partial shade but may fail to flower if it receives too much shade. Like the black willow, the wafer ash does well in seep areas found in riparian zones. It flowers in March and bears fruit August through September. The fruits are borne on drooping clusters on slender pedicels and have a thin wafer-like appearance. The seeds are oblong or ovoid, leathery and reddish brown.

The wafer ash's most valued use in nature is to serve as a host plant to the giant swallowtail butterfly and the two-tailed tiger swallowtail butterfly. These butterflies lay their eggs on the leaves, and the caterpillars feed on the leaves after hatching. When the swallowtail larvae first hatch, they resemble bird droppings. This imitation protects them from predators until they are larger and morph into a beautiful green color that matches the leaves. Other floral visitors include bees, wasps, flies, and ants. White-tailed deer do not make use of it as browse because of the bitter taste of the leaves.

The dried wafer-like fruit has been used as a substitute for hops in beer making in the past, hence the name hop-tree.

TASAJILLO (PENCIL CACTUS)

Cylindropuntia leptocaulis

TRAIL MARKER: 7

N 30° 44' 1.6" W 098° 21' 50.5"

Watch out for this plant! Its prickly spines are barbed and can be difficult to remove. The pencil cactus got its name from the stem's resemblance to a pencil. The stem is covered with spines that can be up to two inches long. It tends to live in areas where other shrubs are present and, in ideal conditions, can sometimes grow to heights greater than four feet when it is being protected by neighboring shrubs. Each new growth or branch can grow to six inches and often twists and tangles with other branches and shrubs nearby, creating a dense and woody thicket of spines. It produces a beautiful light yellow to yellow-green flower that only opens in the late afternoon and then closes at night in the months of May and June. This cactus is commonly referred to as the desert Christmas cactus because of its bright red berries that appear after the cactus flowers. Anther common name for this plant is jumping cactus.

AGARITA

Berberis trifoliolata

TRAIL MARKER: 8

N 30° 44' 1.7" W 098° 21' 50.2"

The agarita is a small evergreen shrub growing in many soil and weather conditions throughout the Texas Hill Country. The stiff and pointy leaves resemble that of the holly plant. It provides shelter for birds and small animals.

Agarita has small yellow blooms in the spring that attract honeybees because of the rich pollen. The small red agarita berries are also a valuable food source for birds and other wildlife and can be used to make a sweet delicious jelly.

Many Texas herbalists consider this a favorite medicinal plant because every part of the plant has a use. Historically, the roots and the leaves provided treatment for many ailments, from fevers to stomach disorders. The bark was chewed by Native Americans to treat gum diseases. The Mescalero Apache shaved the bark, mixed it with water, and used it as an eyewash. The entire plant was used as a ceremonial plant by many Native Americans. The yellow wood of the plant as well as the berries have been used for dyes for hides and skins as well as for face paint. Today, the berries are used for fabric dyes. Agarita is a desirable addition to any landscape, not only for its modern uses and drought tolerance but for the fascinating history it holds.

CYCLES OF NATURE

TRAIL MARKER: 9

N 30° 44' 2.1" W 098° 21' 49.3"

From this viewpoint, you can envision many examples of the cycles of nature. The physical environment abounds with these natural cycles — day and night, the seasons of the year, the cycles of abundant rainfall and drought.

At the left edge of the meadow in front of you is a Texas persimmon tree, which is described on the next page. Across the meadow, there are yucca plants that periodically send a flowering stalk six to 10 feet above the ground. You will find more information about yucca plants further along the trail.

Beside the post, you can see a stump of a loblolly pine with very obvious growth rings. Most trees produce one new ring every year. Can you discover how old this tree was when it was cut down?

The mix of juniper and hardwood trees you see (pecan, live oak and others) changes over time. You may notice some of the juniper trees with dead branches. This is a sign of drought. These trees react to reduced rainfall by letting some of their limbs die off to conserve how much water they need to survive.

On the ridge beyond the meadow, you can see rocky outcrops. These represent part of the endless geological cycle of mountain building and erosion.

Humans are also part of the cycles of nature. In the fall, Native Americans ate the fruits of the Texas persimmon. They also used various parts of the yucca plant. The fibers of the long spears were spun and braided into cords and rope. The sharp spikes on the end of the spears were used as needles. The roots of the yucca can be used to make soap. As a result, the yucca is sometimes called the "rope and soap" plant.

TEXAS PERSIMMON

Diospyros texana

TRAIL MARKER: 9

N 30° 44' 2.1" W 098° 21' 49.3"

The Texas persimmon is native to Texas, living mostly in the southern portions of the state. Here at Inks Lake State Park, most of these trees reach to heights of 12 feet and higher with multiple trunks and smooth, peeling bark resembling a crape myrtle. Its leaves are thick and leathery and somewhat fuzzy underneath.

Other distinguishing characteristics are its drought resistance mechanisms. The shape of its leaves and the smooth bark guide rain water down to the base of the tree so that every drop can be used by the roots. If drought becomes severe, the leaves of the Texas persimmon will drop until the drought is over and will come back as soon as there is adequate water for survival.

This unique tree is dioecious, meaning that there are male and female trees. Only the female trees produce fruit. The Texas persimmon tree blooms from February to June. In August and September, Texas persimmons ripen into glossy black and very sweet fruits with multiple large seeds providing a very palatable food source for native wildlife (and park visitors). The fruit is edible to humans, but be sure it is ripe before taking a big bite. Ripe fruit will be dark purple to black in color. Ethnographic records indicate Native Americans used the fruit medicinally as an astringent to treat mouth ailments.

MOSS and LICHENS

TRAIL MARKER: 10

N 30° 44' 2.5" W 098° 21' 48.6"

At this trail marker, you see examples of moss, which is the dark green plant growing on the rock, as well as lichen, which is the lighter sage-colored plant.

MOSS

Bryophyta

There are 12,000 species of moss with the scientific name *Bryophyta*. Most mosses are less than four inches tall. The damp gneiss outcroppings at Inks Lake State Park provide an ideal habitat for mosses.

Mosses are non-vascular plants without proper roots. They are herbaceous, or non-woody, absorbing water through their leaves and harvesting sunlight to create food through photosynthesis.

Moss species grow primarily near damp areas with a water supply. Mosses are further classified by what they are growing on: rocks, waterfall spray areas, tree trunks, or disturbed soil. They rely on the wind to disperse their spores.

Mosses provide us with an early warning, or bioindicator, of air pollution. The nitrogen levels in moss can be monitored. Some will not grow in an area of high pollution. Some mosses are used in the treatment of wastewater.

Mosses are becoming popular in commercial and residential landscapes because of their velvety beauty and because they provide contrast to other plants.

LICHENS

Unlike mosses, lichens are not a single organism. They are a combination of two different organisms, usually a fungus and an algae. The fungus and algae work together in a symbiotic relationship, meaning that they both benefit. The fungus provides moisture and shelter while the algae photosynthesizes and produces food in the form of simple sugars. Nitrogen is provided by bird excrement, organic debris, and plant leachate. There are as many as 20,000 species of lichen with more being discovered.

The most commonly found lichens in the park are crustose lichens. Crustose lichens are considered to be a pioneer species because they can grow where other species cannot. These interesting organisms literally eat stone, turning rock into dirt. The fungal part of the lichen produces a chemical that breaks down the rock and over many years produces enough soil for other organisms to grow.

Lichens grow on trees, rocks, and soil. They are non-parasitic to trees. Some scientists believe that the presence of lichens may be an indicator of pure air quality as they will not grow in a smoky or polluted environment. Some lichen extracts may be used for dyeing fibers.

ASHE JUNIPER

Juniperus ashei

TRAIL MARKER: 11

N 30° 44' 2.9" W 098° 21' 44.3"

Ashe juniper is very abundant in Central Texas and can be seen almost everywhere you look in the park.

Ashe juniper is sometimes referred to as mountain cedar and is the cause of the dreaded "cedar fever" that many Texans are cursed with every year. According to many locals, juniper berry tea may be effective against "cedar fever."

Native birds have taken advantage of the overabundance of Ashe juniper. Older stands, or groups, of Ashe juniper and oaks are the primary habitat for endangered species such as the golden-cheeked warbler and the black-capped vireo. As the tree ages, its bark becomes shaggier and almost fluffy, providing for the perfect nesting material for some species of birds, most notably the golden-cheeked warbler. Big thickets of these older stands are now disjunct or in isolated areas, creating a loss of habitat for these species.

The wood of the Ashe juniper is extremely rot resistant, which makes it very good fence post material. It provides year-round shade for wildlife and is great for erosion control, but is considered by some to be a "water hog" that competes with other vegetation for rainwater. However, the tree will die if it receives too much saturating moisture over a period of time.

Now, if you follow the directional arrow to the left, the trail markers will be in the same order as this guide.

BOTTOMLAND DECOMPOSITION

TRAIL MARKER: 12

N 30° 44' 3.5" W 098° 21' 37.7"

Behind this marker is a magnificent pecan tree, but the phenomenon of interest here is on the ground around you.

Pecan Flats is an example of bottomland, the areas near a water source where the water table is near enough to the surface that plants like pecan trees can grow.

What is the difference between soil and dirt? Dirt has no living organisms in it. Soil is the combination of dirt and the microorganisms that allow plants to grow. Where does dirt and soil come from? It may seem like a silly question, but the answer is more subtle than you might think. Ultimately, dirt accumulates from dust particles within every raindrop and more importantly from the decomposition of plant and animal life.

Decomposition is a very vital part of bottomland ecology. Snags, which are dead trees, and fallen logs are home to many organisms, some that cannot even be seen by the naked eye. These microorganisms break down the litter on the forest floor, replenishing the nutrients in the soil. Besides being home to microorganisms, they also provide shelter and habitat for small animals and some bird species. This is one of many reasons why firewood should not be collected in the park.

PECAN

Carya illinoinensis

TRAIL MARKER: 13

N 30° 44' 3.8" W 098° 21' 33.3"

You may wish to take a seat on the bench to see a small grove of pecan trees across from the bench. The United States is the only place in the world where the pecan tree grows naturally. It is so popular in Texas that it was named the Texas state tree in 1919 by the Texas Legislature. Today there are over 70 million wild pecan trees in the Lone Star State, and the United States produces more than 350 million pounds of pecans yearly. Pecan trees need a lot of moisture and so are usually found in areas where water is available.

The pecan is the most popular tree nut. The meat, or the edible part of the nut, is packed with 19 different vitamins and minerals that make the pecan a healthy snack. It can be used or prepared in a variety of different ways, including raw, chopped, roasted, and cooked. It is used in many Southern dishes, including the famous pecan pie. It was a favorite treat of two of our famous presidents, Thomas Jefferson and George Washington. The pecan got its name from the Algonquin word *paccan* or *pakan*, meaning "all nuts requiring a stone to crack." It was of great importance to the Native Americans because of its high fat content and high nutritional values. Native Americans made a creamy milk from the pecan by crushing the nuts into small pieces and placing them into boiling water. This pecan milk is very similar to one of our vitamin enriched energy drinks today.

However, the pecan is used for more than just a food source. When the pecan shell is crushed, it is used to polish metal, wood, and jewelry. It is even used in some facial cleansing cosmetics. Additionally, the pecan shell may be used for mulch.

Nearby, you can see Pecan Flats. Imagine the events that have taken place since these trees have been here, from the last Native American battle at Packsaddle Mountain in 1873 to the creation of Inks Lake State Park in 1939. These revered trees have provided shelter and sustenance for native wildlife for many years. Take some time to enjoy this unique and beautiful part of Inks Lake State Park.

LIVE OAK and POST OAK

TRAIL MARKER: 14

N 30° 44' 2.5" W 098° 21' 30.2"

At this trail marker, you can see two different types of oak trees: a live oak on your right and a post oak on your left. The leaves of the two types of oak are very distinctive.

LIVE OAK

Quercus virginiana

Where did the live oak get its name? Is it always green? The live oak is a semi-evergreen tree with wide-spreading horizontal and arching branches that can reach heights of 30 to 50 feet. The live oak gets its name from the fact that once it drops its leaves in the spring, it immediately grows new ones to give the illusion that it stays green all year. The live oak has dark green leaves with waxy tops. It produces catkins, or flowers, in the early spring that release yellow pollen. This yellow pollen blankets everything in sight and can sometimes cause allergies in humans. The branches are often covered with ball moss.

The live oak grows rapidly at first, but then slows its growth as it matures. It is a long-lived tree and is considered the preeminent Southern shade tree. Its acorns are a favorite among birds, squirrels, and deer, and its pollen is important to bees. The bark is a commercial source of tannin and is also used for dyes of various colors. Native Americans used the seed after leaching as an edible and used it medicinally as an astringent.

POST OAK

Quercus stellata

The post oak is a small- to medium-sized tree that grows to an average of 75 feet in height with very heavy limbs and a rounded head. The trunk can attain a diameter of three feet, but it is usually smaller. It is a slow growing tree that can live up to 500 years. The tree gets its name from the frequent use of the trunks for fence posts, railroad ties, and mine supports. Leaves are four to five inches long, thick and leathery, and are dark green in spring and summer, turning golden in the fall.

Male and female flowers are on the same tree and appear as the leaves emerge. Male flowers are drooping yellow catkins. Female flowers grow in small clusters and are reddish in color. The post oak grows in dry to sandy soils that are often nutrient poor. The acorns are about one-half inch long, are ovoid in shape, and ripen September through November. The post oak is often planted as a shade tree. Like other oaks, the acorns provide food for squirrels, deer, birds, raccoons and other small animals. The leaves are used for nest building by birds. Some animals use the tree cavities in the trunk or limbs as homes.

Native Americans consumed acorns from many oak species, including those from the post oak. Parts of the tree were used to treat skin infections, fevers, dysentery, and canker sores.

CHINABERRY

Melia azedarach

TRAIL MARKER: 15

N 30° 44' 2.1" W 098° 21' 29.6"

Chinaberry is a native of Asia. Many consider it to be a bothersome invasive tree because of its widespread and prolific growth in Texas and towards the Northeast. Neither bees nor butterflies are attracted to the pollen. Birds will gorge on the fruit and act in a "drunken" manner after doing so, but are otherwise immune to its ill effects. The fruit is poisonous to humans with symptoms after ingestion including stomach pain, lack of coordination, pulmonary congestion, and vomiting.

Chinaberry is an example of an "exotic invasive" species. Native species of plants and animals evolved with a balance between species. When species like the Chinaberry tree are brought from another area, the native species are not prepared to compete with the exotic species. As a result, invasive species spread without an ecological check on their growth. Other exotic invasive species include kudzu vine, Chinese tallow, Johnson grass, privet and feral hogs.

Chinaberry is a member of the mahogany family. It grows to an average height of 45 feet. Other names for the tree are bead-tree, Indian-lilac, and pride-of-India. The word *azedarach* in its scientific name is an old Persian word meaning "noble tree." The leaves can sometimes grow up to two feet long. The tree flowers March through May with open, fragrant, purplish flowers. The fruit ripens in September and October and is fleshy, yellow, and smooth with three to five black seeds inside that are easily dispersed by birds.

The main use for Chinaberry is the wood because it resists warping and fungal infections. The seeds were used for beads in the past before plastic became popular.

NATURAL PROCESSES

TRAIL MARKER: 16

N 30° 44' 2.0" W 098° 21' 29.2"

At this viewpoint, you can see another oak tree. From the earlier description of post oak and live oak trees, can you tell what kind this one is? You may also be able to see a prickly pear cactus growing in the crook of the trunk. Cacti have evolved to be able to survive with very little water, in this case, just the amount of water that is available high in this oak tree.

Throughout history, wildfires have been part of the natural environment. Sometimes caused by lightning, wildfires would spread quickly and last until they burned themselves out. Many plant species have adapted to the periodic occurrence of wildfires. Texas Parks and Wildlife uses prescribed fires to reduce the litter load and restore the environment.

VEIN OF QUARTZ

TRAIL MARKER: 17

N 30° 44' 0.4" W 098° 21' 30.7"

Up on the rock, you will see several wide veins of a white, shiny mineral. This is the mineral quartz, which intruded into the surrounding metamorphic rock gneiss (pronounced "nice"). Quartz is a common mineral found in sedimentary, igneous, and metamorphic rocks. About 12 percent of the Earth's crust consists of quartz. Quartz is most easily seen in many igneous rocks, particularly granitoids or granite-like rocks because of their coarse texture.

Many times when we see quartz within the park it comes in veins such as this. This is because in this area the quartz is related to a series of granitic intrusions of the Earth's crust around 1 billion years ago. During that time, molten rock, called magma, intruded into the crust at a depth of around eight miles. Often we just see quartz veins because quartz is the first mineral to crystallize out of the magma.

There are many colors of quartz, however the type at this park is generally white. Other minerals found in the Texas Hill Country are topaz, which is the Texas state mineral, serpentine, tourmaline and microcline feldspar, which is responsible for giving the granite here it's famous pink color. Llanite, a form of rhyolite, has blue zoned quartz and red feldspar and is found only in Llano County.

MUSTANG GRAPE

Vitis mustangensis

TRAIL MARKER: 18

N 30° 44' 1.3" W 098° 21' 33.9"

The vines of the mustang grape would make even Tarzan jealous. The mustang grape grows to massive sizes and covers everything it touches like a blanket. The vines droop down from the trees like a maze of rope, and they also climb up trees and fences using forked or branched tendrils. The scientific species name, *mustangensis*, comes from the Spanish word *mesteño*, meaning "feral" or "wild."

The fruit grows in groups, not pendant clusters, and ripens between June and August. Ripe fruit will be a deep red to black color and can be eaten in pies and the famous mustang grape jelly. The leaves are covered with little white hairs and may be harvested young and wrapped around other foods. A yellow dye can be obtained from the fresh or dried leaves.

Continue walking until you come to the sign that says "Scenic Views." If you go to the left, the interpretive trail will continue up to several panoramic views. The trail can be rough and uneven, so watch your step. If you prefer a shorter walk, you may go to the right and loop back to the Ashe Juniper at Trail Marker 11.

VALLEY SPRING GNEISS

TRAIL MARKER: 19

N 30° 43' 51.2" W 098° 21' 35.7"

Inks Lake State Park contains some of the oldest rock in the United States. It is called Valley Spring gneiss (pronounced "nice") and was named after the community of Valley Spring in Llano County. The related German word *gneist* means "sparkly." The mineral mica gives the rock its sparkly appearance. This pre-Cambrian pinkish metamorphic rock is roughly foliated or banded and was formed from millions of years of intense heat and pressure applied to the original material: sedimentary rocks (sand, silt, and mud) as well as igneous material (likely granite). Valley Spring gneiss accounts for the vast majority of the rock here in the park (more than 90 percent). The most common minerals in gneiss are quartz, potassium feldspar, sodium feldspar and mica.

Here is another example of quartz within the gneiss. Quartz is a hard, translucent mineral, but in certain light conditions, the quartz will seem to have different hues. The color comes from impurities or additions within the quartz. Iron oxide or manganese will tint the quartz a pinkish color. Amethyst will give it a violet tone. Here in the park, the quartz has a primarily a white color. Veins of quartz can be found in sedimentary, metamorphic and igneous rocks. You may see more quartz veins as you continue your walk.

VERNAL POOLS

TRAIL MARKER: 20

N 30° 43' 49.5" W 098° 21' 35.4"

While observing the gneiss, you will find that it has many indentations. These shallow indentations are called vernal pools. You will also notice that the gneiss is banded or foliated. This is the result of alternating layers of dark and light minerals. This is one of the features that helps distinguish gneiss from other rocks.

The vernal pools in the gneiss are wet during the spring when the area receives most of its rainfall, and at other times when rainfall has occurred. Many organisms such as worms, flies and dragonflies lay their eggs in these pools. These eggs resist drying out and remain viable when the pools become dry during the hot summer months or times of drought. These eggs will hatch when triggered by certain environmental cues such as temperature, light and the presence of water.

CLARET CUP CACTUS, LACE CACTUS, YUCCA and PRICKLY PEAR CACTUS

TRAIL MARKER: 21

N 30° 43' 48.7" W 098° 21' 36.1"

At this trail marker, you can see three different types of cacti as well as a yucca plant. Please do not disturb these plants. Despite their thorny protection, they are fragile.

CLARET CUP CACTUS

Echinocereus coccineus

The claret cup cactus is a type of hedgehog cactus. In fact, the word *echinocereus* in its scientific name comes from the Greek word "hedgehog." Early settlers believed the spines made the cactus look like a hedgehog. All hedgehog cacti have clusters of three spines along rib-like structures. A claret cup cactus will grow up to 12 inches tall and 18 inches across. It sometimes also grows near the base of a tree and takes advantage of the dappled shade and disturbed soil.

Hedgehog cacti have flowers that last only a few weeks or less. The blooms of the claret cup are waxy and orange to red, stay open all night, and last only a few days. The hummingbird is the chief pollinator of the claret cup cactus. The bird must put its entire head into the funnel-shaped flower, consequently receiving a complete dusting of pollen on its head. The fruit that follows the flower is sweet and delicious.

Claret cup is also known as kingcup cactus, strawberry cactus, or mojave mound cactus.

LACE CACTUS

Echinocereus reichenbachii

As the saying goes, everything in Texas either bites, sticks, or stings. However, do not overlook the beauty of something just because of that. The lace cactus is among those that stick, but take a close look at its spines. The arrangement of the spines gives the appearance of lace, which gave rise to its name. Lace cactus is also called hedgehog cactus, rainbow cactus, purple cactus, and comb cactus.

This cactus grows in colonies or small groups, reaches heights of about six inches, and does not like a lot of moisture or shade. Depending on where you are in Texas, the blooms take on an array of colors. Here at Inks Lake State Park the lace cacti tend to range from pink to a rich magenta color.

YUCCA

Yucca constricta Buckley

There are several varieties of yucca plant in the park including Buckley's and Spanish dagger. If you gently touch the tip of its leaves, you will know why. The yucca's yellow-green leaves stay evergreen and are very flexible, with sharp tips and fibrous leaf margins. Its flowering stalk can reach up to seven feet tall with cream-colored bell-shaped blooms attracting insects from miles around. The flowers of many species of yucca are edible; indeed, tribes including the Hopi, Navajo, Pima, and Zuni all used the Banana Yucca fruit.

The yucca is also known as the soap and rope plant. In the past, Native Americans took yucca roots (known as *amole*), crushed them into a pulp, and then put that pulp in water to produce a lather used for soap and shampoo. Native Americans also used the fibers of the leaves of the yucca to weave mats, baskets, cloth, rope and sandals.

PRICKLY PEAR

Opuntia engelmannii var. *lindheimeri*

The prickly pear was named the Texas state plant in 1995 and sometimes is referred to as the cactus pear or Indian fig. The prickly pear is extremely tolerant of a variety of soils, temperatures, and moisture levels, which allows it to be right at home in Texas. They can grow to heights as great as seven feet in an ideal habitat.

This native succulent is composed of flat fleshy pads, considered to be branches, which are covered in clusters of fine, tiny, barbed spines called glochids. These pads serve several vital functions, including photosynthesis for food production, water storage, and flower production. Some species of prickly pear are considered spineless, but don't let this fool you. They are not! Even spineless prickly pears have glochids that are very difficult to remove from your hand because they are so tiny.

This Texas cactus blooms in the spring, decorating the state in colors of yellow, red, or purple. The fruit ripens from July through September, producing a delicious snack that is edible and is sold in stores as prickly pear "tuna." The fruit may also be processed into syrups or jellies. Prickly pear pads are also edible and eaten as a vegetable called *nopalito*. The prickly pear is very palatable to cattle, so ranchers use propane torches called "pear-burners" to burn the spines off so they can be foraged by cattle. The roots of a prickly pear can be used as a form of first aid treatment for splinters or infection when crushed and dipped in warm water, and the sap can be used to produce commercial alcohol.

The prickly pear is also home to a small insect similar to the mealybug and called *Dactylopius coccus*. It appears as whitish spots on the cactus pads. When crushed, a rich red dye known as cochineal dye, is produced. Native Americans used cochineal dye for paint because it was permanent. In the 16th century, this dye was exported to Europe for use by royalty and the wealthy. The insects are less than a quarter-inch long, and it would take 70,000 insect bodies to make one pound of cochineal dye, making it very expensive to produce. Cochineal dye was used on the wool garments for the traditional scarlet color of the British "red coat" guards until 1954.

LLANO UPLIFT

TRAIL MARKER: 22

N 30° 43' 47.2" W 098° 21' 40.9"

The Llano Uplift lies in the middle of the Hill Country and is distinguished from the other regions by the igneous (granite) and metamorphic (gneiss and schist) rocks that once formed the bottom of the Earth's crust over eight miles below your feet. Nearly a billion years of unique and complex geologic processes have now brought it to the surface. These pre-Cambrian rocks form an island called the Llano Uplift surrounded by the much more common limestone that is characteristic of the entire Hill Country.

In the distance you see a distinct rocky outcrop. This is the remnant of a granite intrusion. Granite is much more resistant to weathering and erosion than the surrounding metamorphic rocks, so over time the less resistant rock around the granite erodes and the granite is left to form these rocky buttes.

SCENIC OVERLOOK: BUCHANAN DAM AND INKS LAKE

TRAIL MARKER: 23

N 30° 43' 45.8" W 098° 21' 43"

As you approach this marker, the hilltop to your left is the highest point you can reach on the trails of Inks Lake State Park, 1,022 feet.

BUCHANAN DAM

From this point you are able to see Buchanan Dam, which is owned and operated by the Lower Colorado River Authority. It was completed in 1938.

The dam stretches for more than two miles and is the longest multiple arch dam in the world. This dam was the first to be completed in the Highland Lakes chain, resulting in the creation of man-made Lake Buchanan. Both the dam and the lake are named after United States Representative J. P. Buchanan, who was instrumental in securing federal funds for the project.

INKS LAKE

You also have a view of Inks Lake, which is located in both Burnet and Llano counties. It is a hydroelectric reservoir of the Colorado River in the Texas Hill Country. The reservoir was created in 1938 upon the completion of the Inks Dam. The lake and dam are both named for Roy B. Inks, an original board member of the Lower Colorado River Authority.

Some of the fish present in Inks Lake are sunfish, crappie, white bass, and catfish. The lake is considered a constant-level lake. Inks Lake State Park, which is adjacent to the lake, offers fishing, canoeing, swimming, boating, and other activities.

SCENIC OVERLOOK:
STUMPY HOLLOW AND CAMP LONGHORN

TRAIL MARKER: 24

N 30° 43' 50" W 098° 21' 52.2"

From this viewpoint, you can see Stumpy Hollow and Camp Longhorn. Also, the knoll just to the west and behind you is the highest point in the park.

STUMPY HOLLOW

The area of water you can see down below you is called Stumpy Hollow. Stumpy Hollow is an inlet within Inks Lake that was created in 1938 when the reservoir was completed. Many trees were cut at the time, but many stumps remained underneath the surface of the lake, which is presumably how Stumpy Hollow got the name.

Stumpy Hollow is a popular area for viewing wildlife including birds, deer and beavers.

CAMP LONGHORN

The buildings that you see across the lake are part of Camp Longhorn. Camp Longhorn Inks Lake was established in 1939 by Tex and Pat Robertson. It is located on the shores of Inks Lake along the Colorado River. In many cases, several generations of a family have attended the private camp.

GRANITE BOULDER

TRAIL MARKER: 25

N 30° 43' 54.4" W 098° 21' 50.1"

Just on the edge of the trail, you will see a large granite boulder. Granite is probably the best known of all igneous rocks. It is abundant and widely used in construction. The granite quarried at nearby Marble Falls was used to build the Texas State Capitol as well as the Galveston sea wall.

All of the granite in the park is seen in veins (or dikes) cutting through the gneiss. Some of these dikes can be quite large and these are the only granite outcrops large enough to show up on a park scale geologic map. Granite has at least 20 percent quartz in polyhedral crystals that may be clear to light gray. It also has high percentages of mica, potassium feldspar and sodium-rich plagioclase. The feldspar crystals are usually white to gray or salmon-pink in color.

WET WEATHER CREEK

TRAIL MARKER: 26

N 30° 43' 58.4" W 098° 21' 48.2"

There are three types of flowing bodies of water: perennial, intermittent, and ephemeral. This stream is considered to be an intermittent or wet weather creek. This means that the underground water or the water table is high enough so that when it rains, it allows for the stream to be invigorated and water to flow for a short time until it evaporates and the water table drops. It also means that the stream is able to maintain a riparian habitat. As you may recall, different species of flora subsist along riparian zones, such as willow trees and cattails. You may also see invasive species, such as Johnson grass.

These streams are an important water source to wildlife within the park, but due to the area where this intermittent stream is located, this water is not good for drinking.

DEER BLIND

TRAIL MARKER: 27

N 30° 43' 59.7" W 098° 21' 44.6"

You may have noticed deer blinds scattered through the park. Every year the Texas Parks and Wildlife Department holds a drawing for permitted hunters to win hunting privileges during the months of December and January for deer hunting. There is a limit on the number of does and bucks that can be harvested. Keeping the deer population under control provides for a healthier population.

Also during this time, the hunting of feral hogs is allowed and encouraged. Feral hogs are considered an invasive species. Individually and collectively they do great damage to native plants and wildlife habitat. Hunting is a means to keep their numbers in check.

MESQUITE TREE WITH CLARET CUP CACTUS

Prosopis glandulosa Torr. with *Echinocereus coccineus*

TRAIL MARKER: 28

N 30° 44' 0.4" W 098° 21' 44.3"

Here is another mesquite tree, but this one has a claret cup cactus growing along one of its branches. Claret cup is described at Trail Marker 21.

This mesquite is quite old, possibly more than a hundred years old! When you see a tree that is as contorted as this one, you can be sure it has endured many impacts including damage from high winds, lightning, drought and other natural events.

The claret cup has found a cozy home on the horizontal trunk of this mesquite. Don't get too close; the prickly pear below is not that friendly.

Thank you for visiting the Pecan Flats Trail at Inks Lake State Park. We hope you enjoyed your hike, and will continue to learn more about the nature and culture of this very special park!

TEXAS PARKS & WILDLIFE

Life's better outside.®

4200 Smith School Road • Austin, Texas 78744

www.tpwd.texas.gov

Dispersal of this publication conforms with Texas State Documents Depository Law, and it is available at Texas State Publications Clearinghouse and/or Texas Depository Libraries.

 PWD BK P4507-0015T (7/19)

♻ Printed on recycled paper.

TPWD receives funds from the USFWS. TPWD prohibits discrimination on the basis of race, color, religion, national origin, disability, age, and gender, pursuant to state and federal law. To request an accommodation or obtain information in an alternative format, please contact TPWD on a Text Telephone (TTY) at (512) 389-8915 or by Relay Texas at 7-1-1 or (800) 735-2989 or by email at accessibility@tpwd.texas.gov. If you believe you have been discriminated against by TPWD, please contact TPWD, 4200 Smith School Road, Austin, TX 78744, or the U.S. Fish and Wildlife Service, Office for Diversity and Workforce Management, 5275 Leesburg Pike, Falls Church, VA 22041.