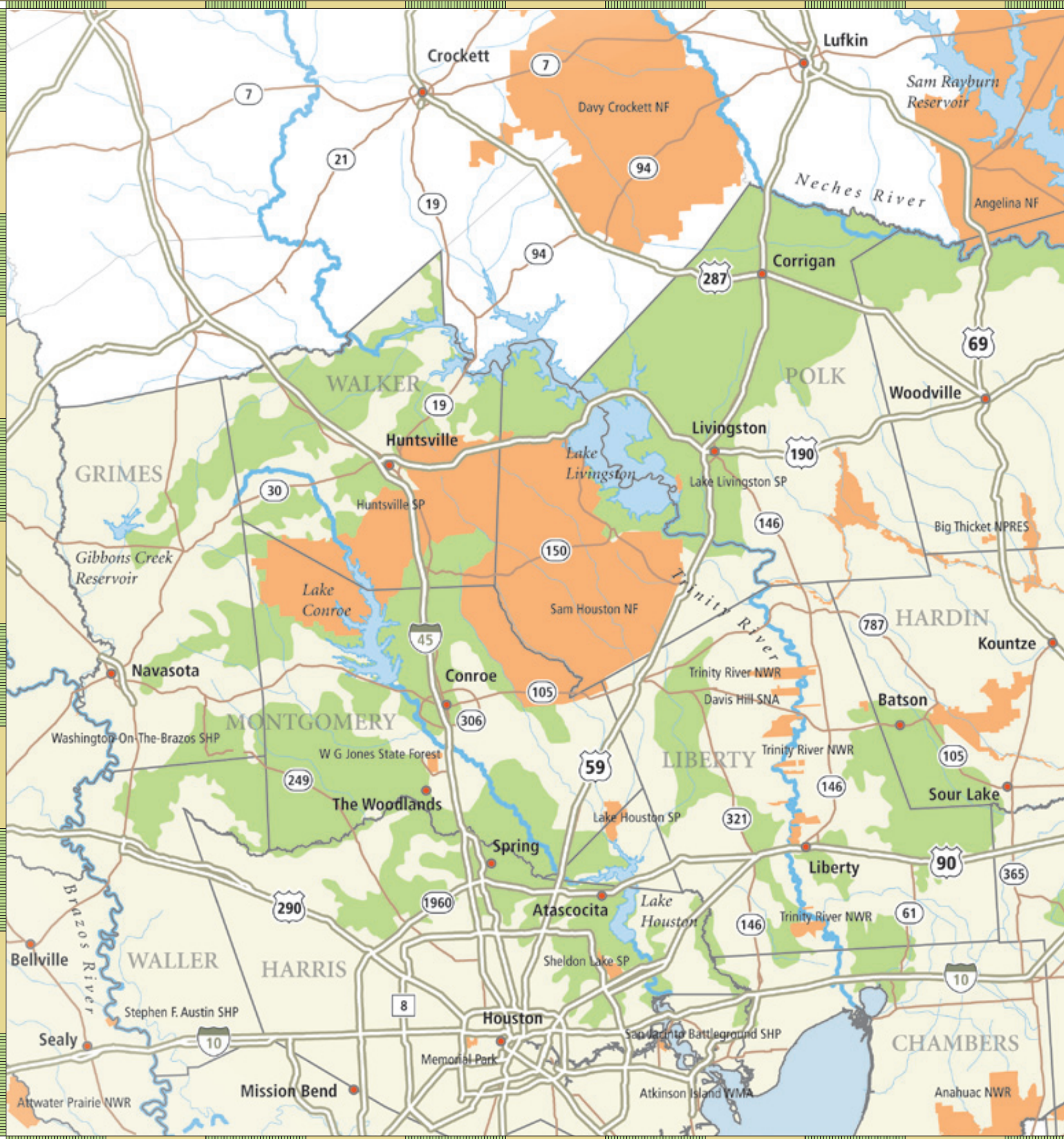
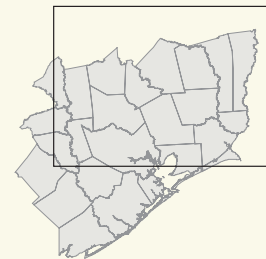


Piney Woods

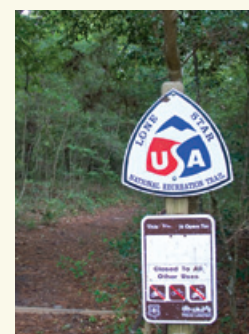




ON TEXAS HIGHWAY MAPS, the Sam Houston National Forest appears as a twin-lobed green area, divided by Interstate 45 and situated about sixty-five miles north of Houston. This forest is the southwesternmost remnant of what was once a huge contiguous pine forest that ran from East Texas through the southeast all the way to the Appalachian Mountains.

For a long time the Texas pineywoods, with their densely jungled riparian areas and sandy soils, unfit for most agriculture, seemed more foreboding than welcoming. Then toward the end of the nineteenth century, as lumbering set in, huge areas of the pineywoods disappeared under the ax and saw. In 1933, with the Great Depression destroying the demand for timber, the Texas legislature invited the federal government to establish the Sam Houston National Forest. The government bought thousands of acres of cut-over forest from impoverished landowners, and while it failed to obtain all the land within the ambitious boundaries marked on planning maps, it did conserve 163,000 acres of pineywoods that are now one of the great natural assets of the Houston Wilderness.

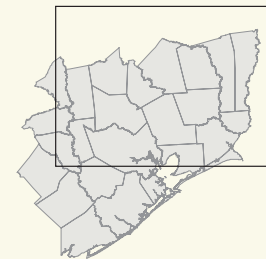
A multiuse area, the Sam Houston National Forest is managed by the U.S. Forest Service in



The Lone Star Hiking Trail is a 128-mile National Recreational Trail that traverses the Sam Houston National Forest from north of Montgomery to northeast of Cleveland.



Left: Visitors to the Piney Woods may experience the tranquility of hiking along an old winding logging road through the sun-highlighted pines.



part for commercial timber harvest, with a portion of the profits going to Walker, Montgomery and San Jacinto counties, where the national forest is situated.

But in this forest, recreational uses dominate. It has become a playground for Houstonians. Its campgrounds draw campers and anglers. Horseback riders explore a network of trails, sharing them with riders of all-terrain vehicles and motorcycles, with surprisingly little conflict. Some trails are dedicated to biking, and off-road bicyclists make up an expanding category of visitors. Hikers enjoy the solitude of the hundred-and-twenty-eight-mile-long Lone Star Hiking Trail, which has its own hiking club that works on trail maintenance. In the fall deer hunters dressed in bright orange prowl the woods, and hikers are advised to wear the same color to prevent accidents.

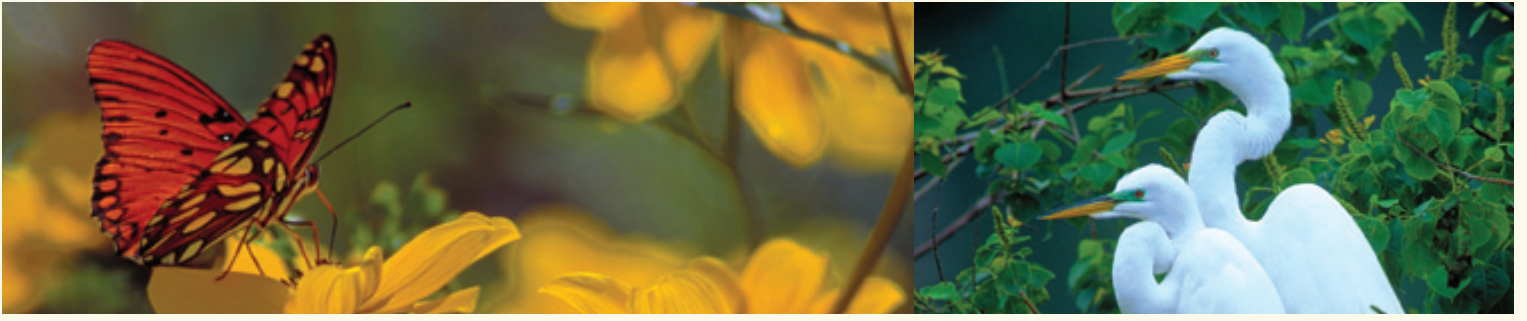
The attractions of the pineywoods are plentiful. There are the trees, of course. Thousands of acres of loblolly and shortleaf pine, sometimes mixed with hardwoods, lower the temperature on summer days. On the western lobe of the Sam Houston forest, resident bald eagles nest in the tall pines and can be seen soaring over the northern end of Lake Conroe. This lake, which was created in the early 1970s by damming the West Fork of the San Jacinto River, draws anglers, many of whom stay at lakeside campgrounds such as Cagle and Stubblefield.

Bald eagles are impressive enough, but if a single creature embodies the story of the Texas pineywoods, it is the red-cockaded woodpecker. This cardinal-sized woodpecker is what ecologists call a “keystone” species: such a habitat specialist that if it disappears, we can be sure the habitat is itself disappearing. The renowned early ornithologist John James Audubon called this the most common woodpecker of the southern forests in the nineteenth century, but today it is in danger of disappearing. Only about ten thousand are estimated to remain in the southern pine forest. Perhaps a few hundred live in our region.

Named for its cockade—a tiny patch of red feathers behind the eye of the male, seldom visible in the field—the red-cockaded woodpecker draws bird-watchers to Houston from all over the world. Those who are “listers” have been known to fly into Bush Intercontinental Airport for the sole purpose of driving to the nearest nesting red-cockaded woodpecker colony in the Jones State Forest, just off I-45 only forty miles north of downtown Houston. If they arrive by about four in the afternoon and wait patiently near known roosting sites, they are almost certain to add the bird to their life lists, for this woodpecker is a creature of habit. That is both part of its charm and a reason for its decline.

Unlike other woodpeckers, which create their cavities in the soft, dead wood of a variety of trees, the red-cockaded woodpecker requires mature living pines sixty or seventy years old, in which the heartwood has been softened by a fungus called red heart. Working chiefly in the mornings after the nesting season, the birds tunnel upward through the sapwood in order to let the resin pitch drain out. Once the bird hits the dry heartwood, it tunnels down to create a rounded chamber, six to ten inches deep and three to five inches wide. Making a cavity takes from one to three years, and then may be used for several years, with the bird continually pecking holes called “pitch wells” around the entrance. The pitch wells allow the pine sap to drip two to three feet, creating a greenish blue and white cascade of sticky pitch, which is thought to deter predatory snakes. The drips give a woodpecker cavity an unmistakable appearance.

Red-cockaded woodpeckers live in family groups of from three to six birds, with one breeding male and female assisted in creating nesting cavities and raising young by one or more juvenile males called helpers. Juvenile females are driven away from the group’s roosting territory, which may include several laboriously carved cavities.



Species common to the Piney Woods include, from left to right: Gulf fritillary, *Agraulis vanillae*; Great egret, *Ardea alba*; Tickseed, *Coreopsis lanceolata*; and the Carolina wren, *Thryothorus ludovicianus*.

When the South held millions of acres of mature pine forests that were regularly scoured by fire, the red-cockaded woodpecker could easily maintain such a specialized lifestyle. If trees in a roosting area were knocked down by a tornado, or infested with pine bark beetles, or if a cavity was taken over and enlarged by aggressive pileated or red-bellied woodpeckers, other areas were available. But with red-cockaded woodpecker habitat diminished by logging and encroached upon by development and the suppression of fire, the only chance of saving these woodpeckers is through human intervention. In trying to save this keystone species, foresters have learned not just about the bird but also about the habitat in which it specializes.

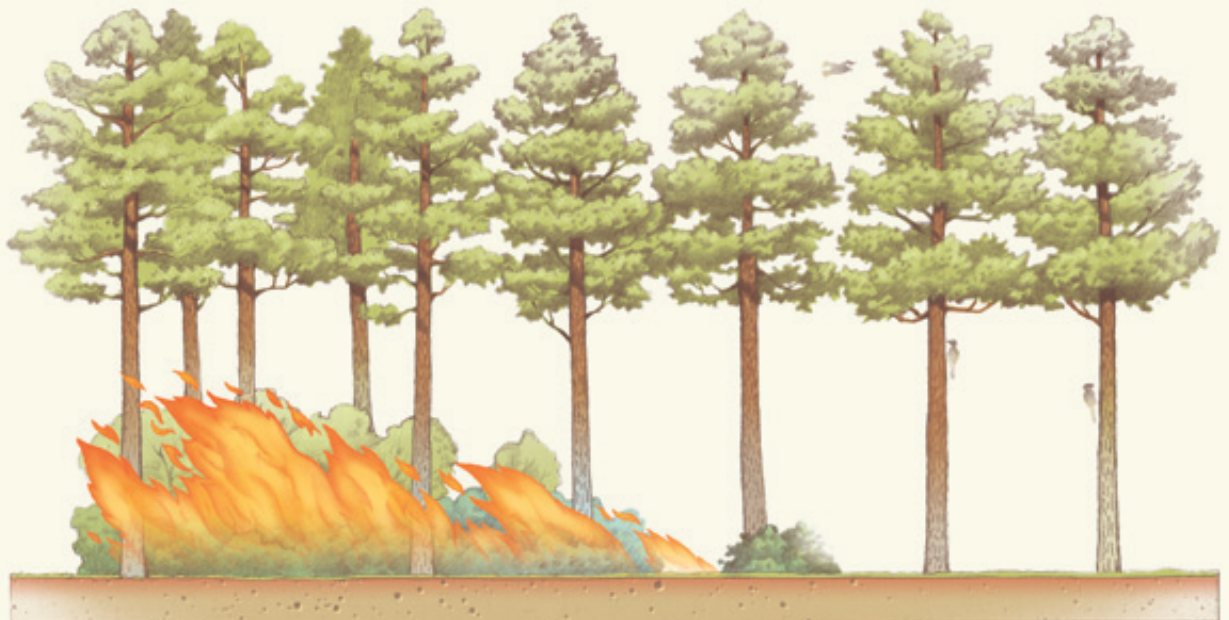
Like the pineywoods, the red-cockaded woodpecker evolved with fire. For a roosting and nesting area, the bird requires an open, parklike stand of mature pines with most of the midstory removed and the trees spaced twenty to twenty-five feet apart. In the past, this spacing was usually done by fire, which also returns nutrients to the soil in the form of ash. Early settlers of the southern pine

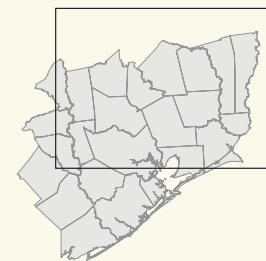
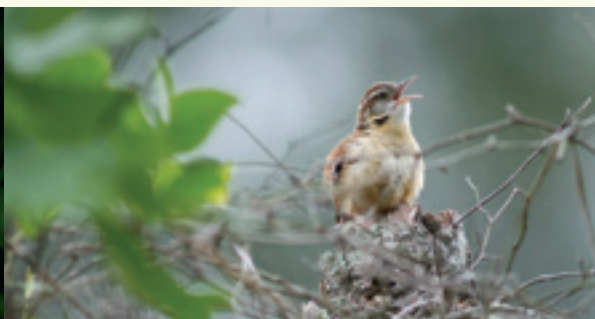
forest reported many such areas through which they could easily drive wagons. These settlers, not to mention Native Americans, were known to set fires in order to clear the understory.

In 1910, when many western forests burned out of control, the U.S. Forest Service adopted fire suppression as its primary mission, embodied in its famous mascot, Smokey the Bear. But as scientific forestry grew, fire suppression has begun to be understood as a central problem in forest management, for it encourages the growth of an unnaturally thick midstory and the buildup of fuels that can eventually produce catastrophic fires. Putting this knowledge into practice is complicated as development has spread and neighborhoods have been built near and even into the pineywoods. The question for foresters now is how to use fire or to emulate its effects in order to preserve the pineywoods and the species that evolved with this kind of forest.

Forests maintain themselves through disturbance. Fire is only one means of forest disturbance. High winds, hurricanes, tornadoes,

Fire disturbance is one way that forests maintain themselves. Fire clears out the woody understory, maintains spacing between trees required for wildlife habitat, returns nutritious ash back to the soil and stimulates the regeneration of new growth.





hailstorms, droughts, disease and lightning also create disturbance. Infestations of the southern pine bark beetle can girdle and kill many trees, another type of disturbance.

Fallen trees in the warm pine forest rot quickly, nourishing a variety of fungi, which in turn provide food for spiders and insects. This insect biomass outweighs that of the other animals in the forest and provides critical food for birds. Fallen trees also prevent erosion by slowing the flow of water so that the soil can absorb it. A decaying tree can become a “nursery tree,” providing a culture in which seeds sprout and grow. Standing dead trees, called snags, provide habit for woodpeckers and owls. Hollowed hardwood trees, called den trees, shelter small mammals such as raccoons.

Disturbances also create holes in the tree canopy, allowing light into the bottom of the forest, which is essential for the growth of new seedlings. A mature pine forest is not a static ecosystem; it is constantly changed by disturbances, both big and small. A natural forest is often called a “shifting mosaic,” because different trees of different ages live in different places, according to light, soil and elevation. Trees start as seedlings, and grow to saplings, poles, mature trees and old growth. The other vegetation in the forest also varies, with grass, forbs (wildflowers) and shrubs creating a variety of conditions that provide habitat for wildlife.

Two pines dominate in the Sam Houston National Forest and other pine lands of the area: the loblolly and the shortleaf. The shortleaf can be

Big Creek and Little Thicket

In the eastern lobe of the Sam Houston National Forest, the mixed pine and hardwood forest of the Big Creek Scenic Area shows how topography and soil can shape the forest. Pines need lots of sun, and most prefer a xeric (dry) soil of the kind found in the upland areas of the forest. In such areas, the pines dominate, and the hardwoods, unable to compete for the sunlight, reach no higher than the midstory.

But in the lowland portions of the Big Creek Scenic Area, hikers can see how pines and hardwoods can mix. Here the soils are hydric (holding lots of water) and mesic (holding moderate amounts of water). A well-maintained trail in the Big Creek Scenic Area follows the meandering route of a creek. Here loblollies compete with magnolias and American beeches for a spot in the sunlight. The magnolias, which can survive in partial shade, are easily recognized by their broad, dark green leaves. But in competing for sun with pines, they tower seventy to eighty feet, their lower trunks bare of limbs. The smooth-barked American beeches tower as well.

This is woodpecker paradise, for the hardwoods provide plenty of habitat. Red-bellied woodpeckers abound, and the huge pileated woodpeckers with their pointed red crests may also be seen. A flowering vine called Carolina jessamine drapes its sweetly scented yellow blossoms atop the midstory trees. Along the banks of Big Creek a native bamboo called switch cane abounds, a sure sign of water.

The trail here is part of the hundred-and-twenty-eight-mile-long Lone Star Hiking Trail, which leads north to Double Lake, a camping area with two small lakes suitable for fishing from canoes and kayaks.

Just a few miles west of Big Creek, south of the village of Evergreen, is the six-hundred-and-fifty-five-acre Little Thicket Nature Sanctuary. This preserve backs onto the national forest and offers fifty acres of meadows and twenty miles of trails. The sanctuary is owned by the Outdoor Nature Club of Houston, a group founded in 1923. The group is devoted to maintaining the sanctuary through volunteer labor. After attending an orientation meeting, volunteers pay a small fee for a gate key and enjoy the use of a beautiful piece of the Houston Wilderness.



*Unlike other woodpeckers, which create their cavities in the soft, dead wood of a variety of trees, the red-cockaded woodpecker, *Piloides borealis*, makes its home in mature living pines sixty or seventy years old, in which the heartwood has been softened by a fungus called red heart.*

identified by its small cones, only an inch or two long, and its namesake needles, which are little more than two inches long. The loblolly pine has needles about six inches long and correspondingly bigger cones about four inches in length. (Both of these trees can be found in Houston's Memorial Park, which is itself a remnant pine forest with an understory degraded by privet and ligustrum, invasive shrub species.)

The longleaf pine, considered the aristocrat of pines, bears even bigger cones and longer leaves than the loblolly. It is the legendary pine of the old growth southern pine forests of the nineteenth century. Longleaf pines are slow-growing, spending their first five years as little more than a bristle of needles above the ground, while sending all their energy into a long tap root that will sustain them to great heights. The longleaf was lumbered extensively and replaced with the faster-growing loblolly. Remnant patches of longleaf pine still stand in the more northern woods of East Texas, but the Sam Houston National Forest and the northern part of Houston are dominated by loblolly, sometimes called "swamp pine" because it tolerates moister soil than the shortleaf and longleaf.

To understand how the pine forest works, there is no better place to walk than the Lone Star Hiking Trail through the Little Lake Creek Wilderness Area, in the western lobe of the Sam Houston National Forest. The trail moves from the northernmost trailhead into a spacious, parklike woodland. The trilling of red-bellied woodpeckers follows the hiker all the way. Here and there one may see a pine warbler, a bright yellow resident that feeds on insects it finds by prying under the plates of pine bark. Another pine forest specialist is likely to be heard: the brown-headed nuthatch. Its call sounds much like the squeak of a child's rubber duck. This tiny bird can be seen flitting through the pine canopy, alighting on pine cones and eating the seeds.

Another scarce bird that specializes in the pine forest is the Bachman's sparrow, a plain brown bird not easily identified and a trophy for the life-listers.

As you walk down the trail, the forest tells stories. In early spring the dogwoods will be in bloom. These trees suck calcium from the ground and store it in their leaves, and when the leaves drop in the fall, this nutrient essential for loblolly pine is returned to the ground. In the understory, blackberry, dewberry, wild plum, persimmon and wax myrtle provide fruit for wildlife. Every few feet along the trail, satyr butterflies erupt and skim along the ground. These gray little fellows with the yellow eyespots take their nourishment not from nectar-producing flowers but from tree sap, fungus, fallen fruit and bird droppings. Unlike the monarchs, which feed on bitter plants and so taste bitter, making birds avoid them, satyr caterpillars feed on grasses and the switch cane that grows along the forest streams, making them tasty. Their chief defense is their coloration, which resembles a dead leaf. But look closely at the yellow-rimmed eyespots, designed to fool a predator into attacking the edge of a wing instead of the body of the butterfly. Satyrs have a beauty all their own.

Down at the south end of Little Lake Wilderness Area, the U.S. Forest Service has been burning, opening up the woods for the rare woodpecker. Trees where the birds have attempted to make cavities are marked with blue or white stripes of paint. If you stop and watch the holes in the evening, and wait patiently, chances are you will hear the birds' returning call. They will alight in the canopy above their roosting cavities, and gradually, almost casually, so as not to attract attention, each woodpecker will work its way down the trunk to its cavity. Take a good look at its back, so distinctly striped in black and white. In the fading light you will see that its markings resemble the fruit of its essential tree, the pine.

