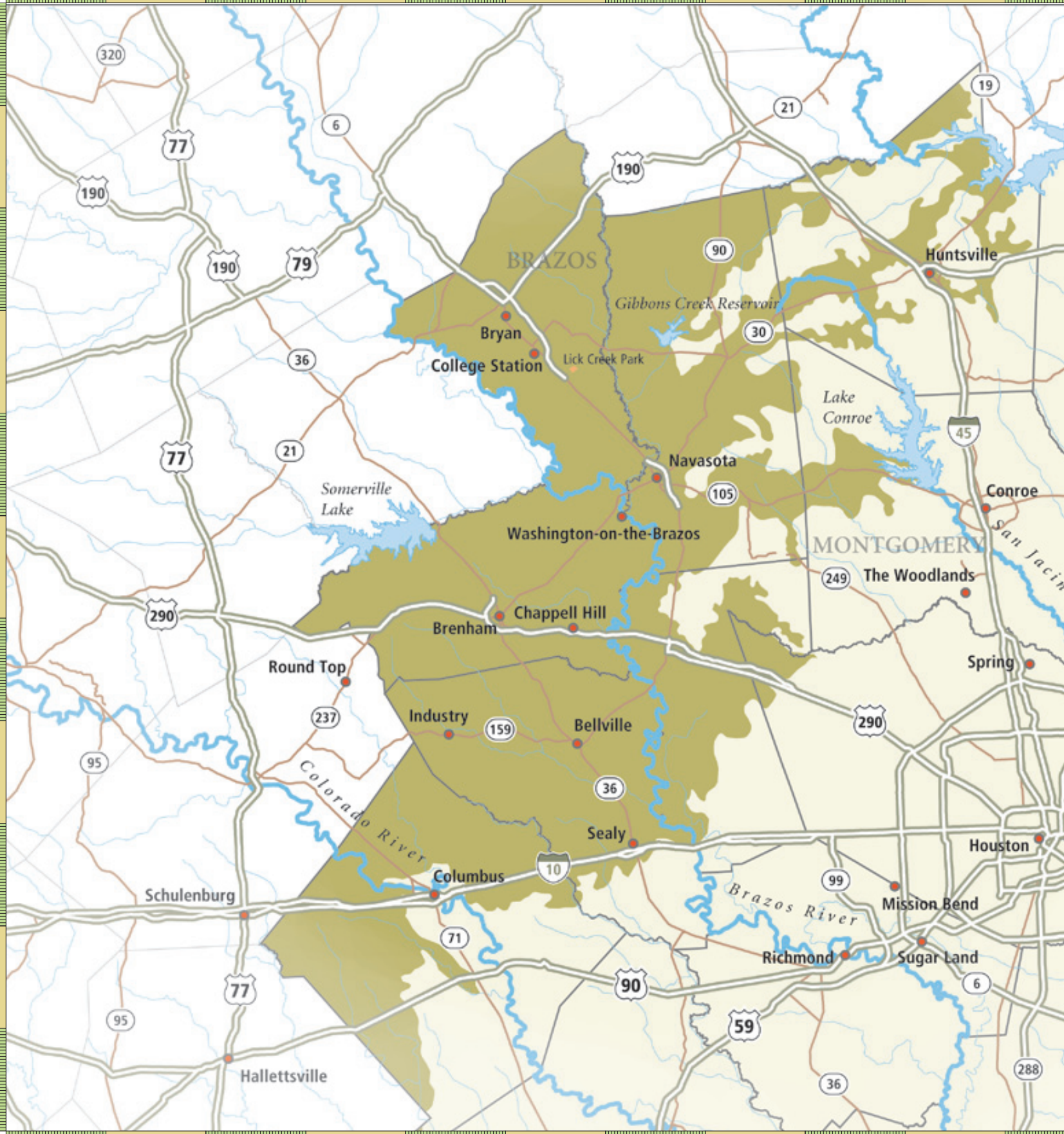
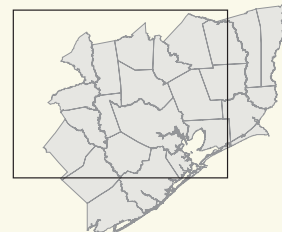


Post Oak Savannah





WILDFLOWERS ARE AMONG the great spectacles of Texas, and there is no better place to see them than in the country known as the post oak savanna. A background in botany is not required to appreciate the bluebonnets massed along the roadsides and covering hillside pastures, or the burgundy displays of the poppy-mallow commonly called the winecup, or of golden fields of coreopsis. Painters

have been trying to capture these effects since Europeans first saw them, and few parents can resist photographing their children in a roadside stand of wildflowers. Indeed, wildflower viewing is so popular that enthusiasts have created websites with maps and photographs to guide people on wildflower tours.

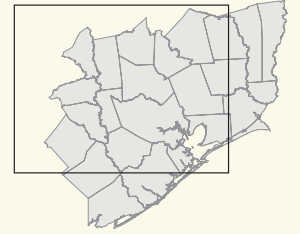


When Houstonians drive northwest on March and April weekends to see the flowers near the little town of Industry, or twist and turn along the two-lane road between the rural village of Chapel Hill and Washington-on-the-Brazos, they are witnessing a sight that is both natural and artificial. Many of the roadside flowers were sown by the Texas Department of Transportation, which has beautified some 800,000 acres across the state in this manner. Once established, wildflowers reseed themselves year after year, their springtime shows varying in intensity according to the weather. The

Winecups, Callihroe digitata, and star daisies, Lindheimera texana, are a common sight in the spring along highways in the Post Oak Savannah ecoregion.



Left: White-tailed deer, *Odocoileus virginianus*, emerge from their resting places to feed in the early morning fog.



ideal conditions are a cold winter that blocks the emergence of competing plants, followed by a wet spring that encourages the seeds to germinate and sprout. Once the blossoms have disappeared, road crews leave the flowers alone for at least a couple of weeks, giving the seeds time to develop fully and drop, ready to germinate the following year. If a roadside patch looks weedy, it is not being neglected. Its wildflowers are being conserved.

Even when their blossoms have faded, wildflowers perform important natural functions. The plants help prevent soil erosion, especially on sandy slopes. Many wildflowers are classified as forbs (fodder) and they provide browse for deer and other wildlife. Like most legumes, the beloved bluebonnet enriches the soil by fixing atmospheric nitrogen through its root nodules.

It has also evolved an interesting pollinating device. Once a visiting bee or butterfly has pollinated it, the tiny white center of the flower turns a reddish pink, indicating to other insects that no nectar is available. The pollinators appear to recognize this signal, and move on to other bluebonnets with centers that have not turned color. Thus the flowers are assured of the greatest chance of pollination, and the insects are assured of finding food with less effort. This is the timeless story of how plants and animals have evolved together.

At least five thousand species of wildflowers are estimated to grow in Texas, making precise identification a challenge even for dedicated botanists, who are constantly deliberating about the taxonomy of these beautiful plants. To complicate matters, the common names are often varied and imprecise. Many Texans, for example, call the commonly found pink evening primrose a “buttercup,” presumably because of its center, which is brightly dusted with yellow pollen. Yet botanists refer to a different family, the Ranunculaceae, as

the buttercup family. The spider lily of wet meadows and roadside ditches is actually a member of the amaryllis family, not a true lily. Field guides for Texas wildflowers list sixty to seventy families. Many lovers of wildflowers content themselves with mastering the genus of flowers they enjoy, without taking the identification to the species level.

Some species present little cause for confusion. The unmistakable Indian paintbrush, for example, looks as though it has been dipped in scarlet ink. It is always seen growing among native grasses because it is semi-parasitic, drawing part of its nourishment from the grass roots. Drop the seeds of an Indian paintbrush in a flowerpot of potting soil, and they will not develop. Other wildflowers also live up to their common names. The abundant Mexican hat, also called a coneflower, bears a tall central cone resembling the crown of an old-time sombrero. The white prickly poppy often sprouts in fields and pastures, protected from grazing cattle by its spiny leaves.

These flowers and many others are the showpieces of the post oak savannah, and if their names are sometimes difficult to sort out, so is the name of the region in which they create such brilliant displays. By most dictionary definitions, a savannah is a treeless plain. How is it that this savannah is named for trees? Even the state’s foremost historian of the natural environment, David Schmidly, seems uncertain about the phrase. In his *Texas Natural History: A Century of Change*, he calls the region both post oak savannah and post oak woodland.

These woodlands, he notes, occupy a strip no more than sixty miles wide across the central part of eastern Texas and extending in a southwesterly direction, “forming a peninsula surrounded by prairies.” Indeed, the post oak savannah stretches from the Red River through the Houston Wilderness and down to the Guadalupe River. The



Wildflowers common to the Post Oak Savannah ecoregion from top left to right: Texas bluebonnets, Lupinus texensis; Blanket flowers, Gaillardia pulchella; Indian paintbrush, Castilleja indivisa; Brown-eyed Susans, Rudbeckia hirta.

terrain is level to gently rolling slopes from northwest to southeast, and is used for farming and ranching. Vegetatively, says Schmidly, the post oak region is an ecotone, a transitional zone, between the eastern deciduous forest and the prairie: “The area supports a stunted, open forest dotted with small tall-grass prairies. The dominant plants of the overstory are post oak and blackjack oak and to a lesser extent winged elm and black hickory.”

Frederick Law Olmsted, the landscape architect who designed Central Park, passed through the region in the 1850s. Heading west, he crossed the Trinity River. “After having been shut in during so many days by dreary winter forest,” he wrote, “we were quite exhilarated at coming out upon an open country and a distant view. During the whole day’s ride the soil improved and the country grew more attractive. Small prairies alternated agreeably with post-oak woods.” Whether we call it a savannah or a woodland, this region has changed greatly in a hundred and fifty years, and as in the case of the pineywoods and the prairies, fire or the absence of fire have played a critical role.

The post oak is a tough, slow-growing tree that thrives in sandy, rocky, well-drained soils and can live to be four hundred years old. It features a broad-lobed leaf and horizontal branches. Its acorns provide a protein-rich food for deer, squirrels and wild turkeys. As the name implies, the post oak was used for fence posts and railroad ties before the advent of pressure-treated wood. Because these trees are drought-tolerant and thrive in poorer soils than other trees, they dominate where other trees would struggle.

Post oaks flourished before the arrival of European settlers because they are moderately fire resistant. While smaller trees are killed by fire, post oaks sprout vigorously from the root collar. With the suppression of fire, the trees once in balance with the grasslands gained an advantage. With

trees’ increased canopies, the grasses under the trees failed to thrive, and the fuel loads for grass fires were reduced. Ecologists trying to restore post oak savannahs argue about how much open canopy is required in order to recreate the open woods and grasses that once prevailed.

Texas Parks and Wildlife Department managers at the Gus Engeling Wildlife Management Area are attempting to restore a post oak savannah. On this 11,000-acre tract, situated in the upper reaches of the post oak savannah near Tennessee Colony, north of the Houston Wilderness, the state has been deliberately burning five hundred acres of post oak uplands on a regular schedule for more than thirty-five years, aiming to create a demonstration area for farmers and ranchers. The hope is that by proper use of fire, the grazing and tillage, wildlife and biodiversity can be restored. Because an estimated 96 percent of Texas lands is in private hands, conservationists believe that the best hope for conserving wildlife is to educate landowners in the techniques of combining productive ranching and farming with wildlife conservation.

Such a strategy is vital for the post oak savannah, in which there is very little public land. At the Gus Engeling WMA wildlife scientists have studied the management of deer herds closely. Deer hunting has become an important economic component of land management: hunters pay prime lease fees if deer are available. In controlled studies biologists have compared the feeding habits of deer and cattle and studied the competition between feral hogs and deer. They have built demonstration plots for farmers and ranchers, showing how to make selective clearings to improve wildlife habitat and how to raise food plots that can be used by deer, quail and other wildlife.

One of the more important projects has been to encourage farmers and ranchers to reverse a trend that began in the 1970s, when upland woods



were bulldozed to create what are often called “improved” or “tame” pastures. These are pastures planted in coastal Bermuda grass, a thick monoculture that looks pretty from the roadside but is in effect a biological desert. Quail cannot use these grasslands, for they cannot move through the thick tangle of grass runners; as quail hunters say, the birds need to feel the dirt beneath their toes. Native grasses grow in bunches that make this possible. Under nineteenth-century farming techniques, quail populations flourished as forests were cut down and edges were created. Pastures held native grasses. Cover from predators was provided in fencerows. Food might be found in truck gardens (farms growing vegetables for market), besides the naturally occurring forbs.

During the last fifty years, however, quail populations have plummeted. Some quail hunters have pet theories about the cause of the decline, blaming the invasion of fire ants from South America, or even the expansion of cattle egrets. But quail biologists say the decline has been caused by loss of habitat.

It is a lesson that has proven itself again and again. Take the case of the native yaupon, recognizable by its bright red berries. Native Americans sought out this evergreen shrub to use its leaves as a purgative (its Latin name is *Ilex vomitoria*). With the suppression of fire, yaupon has invaded the understory of the post oak woods, establishing dense thickets. These thickets have in turn caused the disappearance of wild turkeys in the ecoregion that require an open understory in order to detect predators such as bobcats. If wild turkeys are to return to the post oak woods, the understory needs to be removed and the canopy opened up.

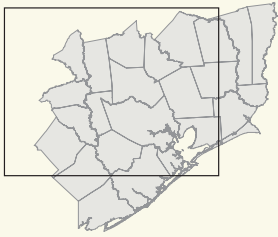
Still, the word is getting out about how to manage land for wildlife. Some landowners hope to make a profit by offering deer, quail and turkey

hunting. In some parts of Texas, hunting leases are already more remunerative than farming and ranching. Landowners working together in wildlife management cooperatives have shown that they can have a positive impact on wildlife. Simple techniques such as controlled burns and fencing cattle out of riparian areas can have an enormous impact.

College Station’s five-hundred-acre nature preserve Lick Creek Park is traversed by several miles of walking, biking and horseback riding trails, and is one of the best examples of publicly owned places in the post oak savannah or woodland. In spring, birders come and hear the loud whistles of cardinals and the songs of wrens. Occasionally a pileated woodpecker utters its maniacal call, evoking the soundtrack for a jungle movie. Warblers and vireos work the spring canopy; indigo buntings may be passing through.

Good as it is for seeing birds, the park is even better for learning about plants. Scientists from Texas A&M University have inventoried the park’s vegetation and have created a website offering a virtual tour with pictures and explanations (<http://www.csdl.tamu.edu/FLORA/ftp/fieldtrips.htm>). Lick Creek Park offers a mix of habitats, including bottomland creeks, a wet sedge meadow, and small blackland prairies invaded by yaupon.

The post oaks are easily identified by their broad, twin-lobed leaves, sometimes resembling a cross. In winter the post oaks are recognizable by their crooked branches and irregular canopy. Resurrection ferns cling to the branches of the post oaks, brown and desiccated during dry spells, vibrant and green after rains revive them. These ferns are epiphytic rather than parasitic and do not harm the tree. Many fruit-bearing plants thrive in the understory, including dewberries, which grow from fibrous vines close to the ground, American beautyberry, farkleberry, and



Bird species of the Post Oak Savannah ecoregion include from top left to right: Scissor-tailed flycatcher, *Tyrannus forficatus*; Northern bob-white quail, *Colinus virginianus*; and the Red-tailed hawk, *Buteo jamaicensis*. An iconic scene of the Post Oak Savannah ecoregion: Texas bluebonnets, *Lupinus texensis*, and Indian paintbrushes, *Castilleja indivisa*, flanking a ranch fence line.

Common wildflowers of the post oak savannah in the Houston Wilderness region.



Wine-cup



Spider Lily



Camphor Daisy



Bluebonnet



Passion Flower



Primrose



Coreopsis



Texas Paintbrush



Texas Lantana

wild mustang and muscadine grapes all abound.

And the wildflowers are impressive. All the usual suspects are here: bluebonnets, Indian paintbrush, Indian blanket, winecups and evening primroses. Don't overlook smaller common jewels such as herbertia, a small blue iris bearing three "tepals," a combination of petals and sepals. In damp places are masses of yellow buttercups.

One of the treasures of the park is a wild orchid called the Navasota ladies' tresses. This endangered orchid appears in only a few Texas counties and is a specialist of the post oak woods. Like many orchids, it produces leaves in the spring, which

gradually wither and die, providing nourishment that enables the plant to produce a single stalk of small white or creamy to green flowers in the fall. Not much is known about this self-pollinating orchid, which appears in scattered spots and is easily confused with a more common orchid.

But this is precisely the fascination of plants. Although they can seem overwhelming in their variety and complexity, they soon reward those who try to understand them, yielding insights about how the intricate interactions of the natural world work. And, of course, in their exuberant shows of color, they reward everyone else too.

