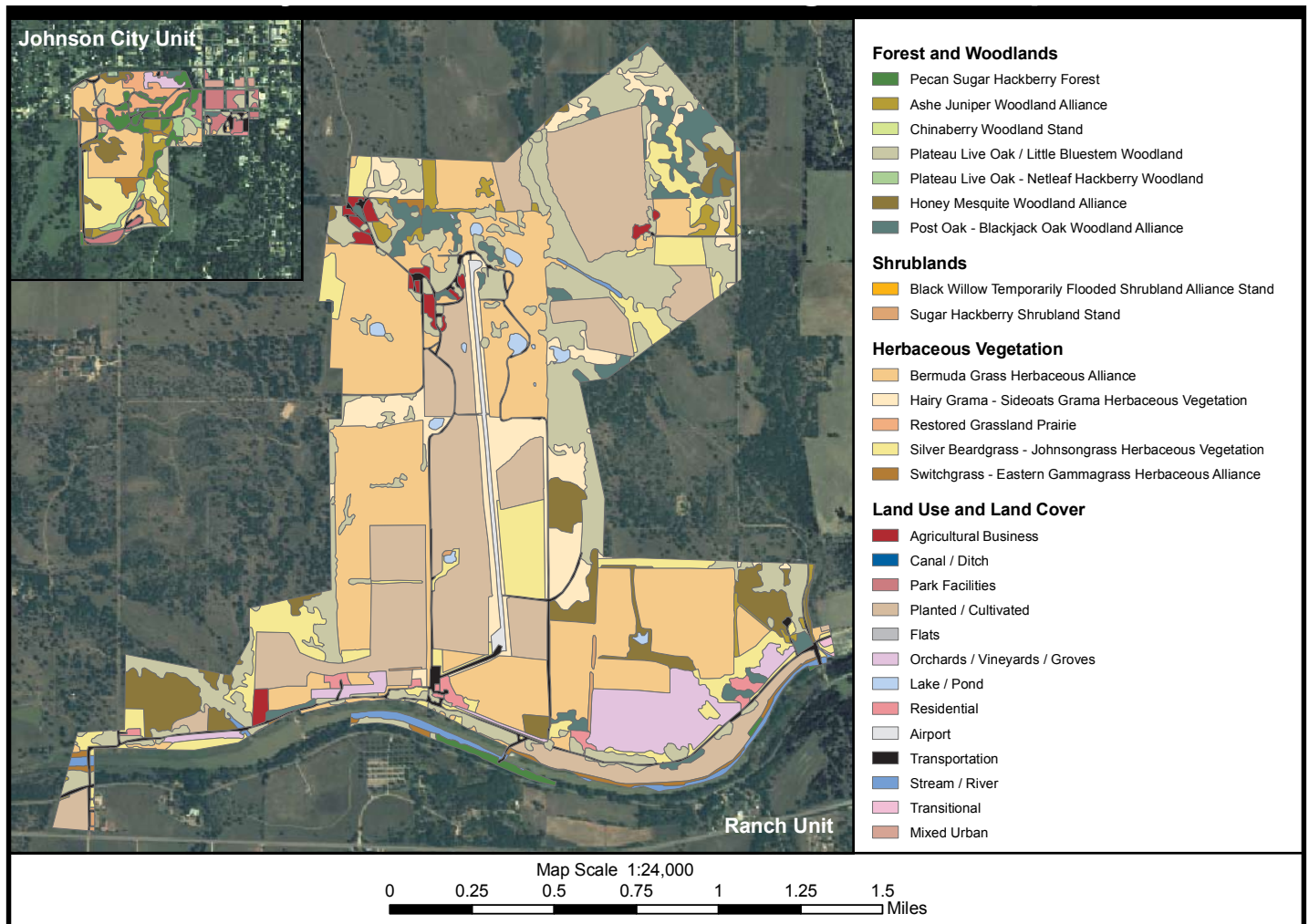


Vegetation Types

QUICK REFERENCE



Vegetation Associations and Alliances

NatureServe maintains a treatment of floristic units (alliances and associations), which are used as classification and mapping units by the vegetation mapping program whenever feasible. Vegetation sample plots and observational points were used to classify the vegetation of this park to these association/alliance levels. NatureServe Explorer®, an on-line database, can be found on the Internet at: <http://www.natureserve.org/explorer>.

Forest and Woodlands

Pecan - Sugar Hackberry Forest (*Carya illinoensis* -

Celtis laevigata Forest)

This community occurs in the Johnson City Unit along Town Creek where it passes by the headquarters building. It has largely been displaced from the Ranch Unit but it is best developed in the State Park along the south bank of the Pedernales River. It also occurs along the creek that flows below the Sauer-Beckman Farm. Pecan trees are found both in the native setting and are also cultivated for nuts in the area. The pecan stands that were obviously planted in rows were mapped as Orchards/Vineyards/Groves. The native stands of this type appeared as mature trees. Open stands were found away from the rivers and had an herbaceous understory. Stands found in the riparian corridors were lush with closed deciduous



canopies. Typically, the ground layer consists of seedlings, low shrubs and vines (especially *Rubus trivialis*), and shade-tolerant forbs (*Geum canadense*, *Verbesina virginica*). In the openings, the herbaceous layer is more dense and diverse, dominated primarily by *Bromus japonicus* and *Cynodon dactylon*, mixed with *Elymus virginicus*, *Panicum virgatum*, *Sorghum halepense*, *Tripsacum dactyloides*, *Tridens flavus*, and *Verbesina encelioides*.

Ashe Juniper Woodland Alliance (*Juniperus ashei* Woodland Alliance)

Ashe juniper stands were found throughout the project area, but were primarily associated with other plant communities in LYJO. In the environs, juniper tended to be more conspicuous and likely represents true associations or alliances. Active thinning of this type was witnessed in the area, especially to the north of the Ranch District. Associated species include evergreen oaks (*Quercus fusiformis*, *Q. vaseyana* [= *Q. pungens* var. *vaseyana*]) and deciduous oaks (*Q. sinuata* var. *breviloba* and *Q. buckleyi*), as well as *Mahonia trifolia* (= *Berberis trifoliolata*), *Bouteloua curtipendula*, *Carex planostachys*, *Celtis laevigata* var. *reticulata* (= *Celtis reticulata*), *Diospyros texana*, *Fraxinus texensis*, *Lespedeza texana*, *Nolina texana*, *Toxicodendron pubescens* (= *Rhus toxicodendron*), *Rhus virens*, *Schizachyrium scoparium*, and *Yucca rupicola*.

Chinaberry Woodland Stand (Park Special - no botanical named association)

Chinaberry trees were found throughout the river and creek bottoms in and surrounding both units of LYJO. Only one mappable stand was observed in the Ranch District, although others may exist. Since this is an exotic species, removal efforts may dramatically effect its distribution over time.

Plateau Live Oak / Little Bluestem Woodland (*Quercus fusiformis* / *Schizachyrium scoparium* Woodland)

This map unit is scattered around the study area and is concentrated on the Ranch Unit in the northern uplands, in the State Park on rocky mounds south of the Sauer-Beckman Farm, and on footslopes east of the Lutheran Church/Rest Area. The situations off the park may represent planted and cultivated types that contain exotic grasses. More sampling focused in these areas would help refine the classification and possibly warrant a new map class. The canopy is low, at about 10-15 meters, while the subcanopy is sparse and not well differentiated from the main canopy, except where junipers have invaded heavily. *Quercus fusiformis* usually dominates over other species. However, on the driest upper slopes with thin rocky soils, *Q. buckleyi* can dominate locally, and on sandier loams of footslopes, *Q. stellata* can become co-dominant. *Celtis laevigata*

can be a minor associate. The subcanopy and shrub layers, when present, consist almost entirely of tree saplings and *Juniperus ashei*. The density of the ground layer varies, depending on the density of the canopy, amount of invasion of junipers, and availability of water to the grasses in the upper slope openings. In the savanna openings, herbaceous composition is similar to that of the Upland Disturbed Herbaceous communities, except that the native *Schizachyrium scoparium* and *Nassella leucotricha* often dominate. Under the tree canopy, the ground layer consists of shade-tolerant forbs (*Verbesina virginica*) and graminoids (*Carex planostachys*).

Plateau Live Oak - Nettleleaf Hackberry Woodland (*Quercus fusiformis* - *Celtis reticulata* var. *reticulata* Woodland)

This community occurs in the Johnson City Unit along Town Creek where it passes through the southern portion of the unit. It has largely been displaced from the Ranch Unit but is best developed in the State Park along both sides of Ranch Road. This type also occurs on the slopes along the creek below the Sauer-Beckman Farm. This type is differentiated from the other live oak type by the presence of deciduous trees in the understory. Composition varies from strongly dominated by *Quercus fusiformis* to strongly dominated by *Ulmus crassifolia*. Associated trees often include *Carya illinoensis*, *Celtis laevigata*, and *Juniperus ashei*. The shrub layer is sparse to moderate consisting mostly of tree saplings, *Juniperus ashei*, and *Ilex decidua*. The ground layer consists of shade-tolerant forbs such as *Calypocarpus vialis* and *Verbesina virginica*, spring ephemeral grasses, such as *Bromus japonicus*, or herbs under small openings in the canopy, such as the disturbance-tolerant grass *Nassella leucotricha*.

Honey Mesquite Woodland Alliance (*Prosopis glandulosa* Woodland Alliance)

This map unit was used to map mesquite ranging from small shrubs to medium trees. This type was largely successional and heterogeneous occurring in old fallow fields. The class was mapped in scattered patches between Ranch Road 1 and Highway 290 near the Danz Farm, near the bison pastures, and scattered throughout the environs. Associated trees may include *Celtis laevigata*, *Juniperus ashei*, *Quercus fusiformis*, or *Sapindus saponaria*. Except for saplings, the subcanopy and shrub layers are lacking. The ground layer is dominated by *Bromus japonicus* and *Cynodon dactylon*. Various weedy forbs (*Croton monanthogynus*, *Marrubium vulgare*, *Ruellia nudiflora*, *Solanum elaeagnifolium*, *Tragia brevispica*, and *Verbesina virginica*) and grasses (*Cenchrus spinifex*, *Setaria schreelei*, and *Sorghum halepense*) are present, especially in shady patches.

Post Oak - Blackjack Oak Woodland Alliance (*Quercus stellata* - *Quercus marilandica* Woodland Alliance)

This map unit is found throughout the project areas; it is concentrated on the park in the northern portions of the Ranch Unit, on convex slopes, and at the State Park on footslopes southeast of the park headquarters. In the environs this type was found in stands that may have been planted. This type did appear similar to the pecan map unit although post oak tended to occur in more dry and open conditions. The canopy is low and sparse, consisting almost entirely of *Quercus stellata*. A subcanopy is lacking. Scattered shrubs include *Juniperus ashei*, *Prosopis glandulosa*, *Diospyros texana*, and *Mahonia trifoliolata*. The ground layer is dominated by *Sporobolus compositus* var. *drummondii* and *Nassella leucotricha*, except where *Cynodon dactylon* has invaded from adjoining cultivated pastures. *Opuntia* spp. are usually present, at least, at low frequency. Various forbs are present, including some wildflower species (especially *Ratibida columnifera*).

Shrublands

Black Willow Temporarily Flooded Shrubland Alliance Stand (*Salix nigra* Temporarily Flooded Shrubland Alliance)

Thickets of black willow were rare on the Ranch Unit, occurring in small stands along the rivers and streams and as small wet depressions in fallow fields. This type was not sampled but was mapped based on observations in the field. Most of the stands appeared to be young or frequently disturbed thickets often having few to no other species present. The presence of this vegetation is related to disturbance frequency, both natural and anthropogenic.

Sugar Hackberry Shrubland Stand (Park Special - no botanical named association)

Small stands of sugar hackberry were observed in riparian and mesic sites in the Ranch Unit of the project. Most of the mappable stands occurred in the environs and no sampling was conducted in this type due to their small size and lack of access. This type is characterized by having small to medium-sized sugar hackberry with few associated trees. Stands of this type may also have occurred as associates in the Pecan – Sugar Hackberry Forest type. With more sampling this type might represent a sugar hackberry association or be joined with the pecan forest type.

Herbaceous Vegetation

Bermuda Grass Herbaceous Alliance (*Cynodon dactylon* Herbaceous Vegetation)

This type was used to map primarily pasture and cultivated land and was differentiated from agricultural fields by its greater mix of native grasses and forbs. This map class was observed in both units where it may have been planted. In the State Park, this type also occurred as several mowed “prairie” areas near the headquarters building and other public display areas where wildflowers have also been seeded. While Bermuda grass is the major dominant, persisting natives include *Aristida purpurea*, *Bouteloua curtipendula*, *Bothriochloa laguroides*, *Dichanthelium oligosanthes*, *Eragrostis intermedia*, *Paspalum setaceum*, *Schizachyrium scoparium* and alien *Bromus japonicus* grasses and low frequency forbs, especially commonly planted prairie wildflower species, such as *Ratibida columnifera*.

Hairy Grama - Sideoats Grama Herbaceous Vegetation (*Bouteloua hirsuta* - *Bouteloua curtipendula* Herbaceous Vegetation)

This map unit was limited primarily to linear strips of small fields in the Johnson Ranch Unit. This type represents the most native of the grasslands and has undergone little disturbance except for some mowing. Some seeding of wildflower species may also have occurred in these areas, in addition to some initial planting of the native seed collected from nearby rocky prairies by the Johnson family in the 1960’s and 1970’s. The most consistent dominants include *Bouteloua curtipendula*, *Bothriochloa ischaemum*, and *Sporobolus compositus* var. *drummondii*. Associated grasses occurring at lower densities include *Aristida purpurea*, *Bouteloua hirsuta*, and *Bouteloua rigidiseta*. A diversity of native prairie forbs are also associated, the most common being *Aphanostephus riddellii*, *Desmanthus virgatus* var. *acuminatus*, *Hedyotis nigricans*, and *Liatris mucronata*.

Restored Grassland Prairie (Park Special - no botanical named association)

This type was used to map stands of vegetation that represent restored prairie. Included were stands in the Johnson City Unit along with one field observed in the environs. This type is characterized by the presence of native tall- and mid-grass prairie species. In the park this class includes sites that are undergoing restoration by removing pecan trees and replacing them with plateau live oak trees. The most consistent dominants include *Bouteloua curtipendula*, *Bothriochloa laguroides*, *Elymus canadensis*, *Nassella leucotricha*, *Panicum virgatum*, *Schizachyrium scoparium*, *Sorghastrum nutans*, and *Sporobolus compositus* var. *drummondii*. Due to shading by the pecans and proximity to swales and drainageways, a number of species are frequent but are atypical to the park (*Carex planostachys*, *Rubus aboriginum*, and *Vitis mustangensis*). A

variety of low frequency grasses and forbs, especially common prairie wildflower species are associated with this vegetation. Of these, *Gaillardia pulchella* and *Ratibida columnifera* are almost always present.

Silver Beardgrass - Johnsongrass Herbaceous Vegetation (*Bothriochloa laguroides* - *Sorghum halepense* Herbaceous Vegetation)

This type represents degraded fields and old pastures that may have been seeded. This type is probably successional and has replaced native grasslands such as the little bluestem-sideoats grama type. This class occurs in both units of LYJO where it occurs as old fields and pastures. In these settings it appeared that the ground had not been plowed in several years and the areas are not maintained as fertilized coastal Bermuda-grass pastures. In the State Park, it occurs in several infrequently mowed grassland areas between Ranch Road 1 and Highway 290. Dominance varies from site to site and among patches within sites. The most consistent dominants include *Bouteloua curtipendula*, *Bothriochloa laguroides*, *Nassella leucotricha*, *Schizachyrium scoparium*, and *Sporobolus compositus* var. *drummondii*. The invasive alien grasses *Sorghum halepense* and *Bothriochloa ischaemum* often form extensive late-season stands, whereas *Bromus japonicus* can dominate sites in spring. A few weedy forbs (*Ambrosia psilostachya*, *Croton monanthogynus*, *Iva angustifolia*, and *Phyla nodiflora*) are usually common. A variety of low frequency grasses and forbs, especially common prairie wildflower species such as *Ratibida columnifera* are associated with this vegetation.

Switchgrass - Eastern Gammagrass Herbaceous Alliance (*Panicum virgatum* - *Tripsacum dactyloides* Herbaceous Alliance)

This native grassland type occurred in both units of the park. At the Ranch Unit, this type occurred primarily along the banks of the channel of the Pedenales River and in swales of the primary terrace of the river. In the Johnson City unit, switchgrass was restricted to the old channels or sluggish drainage-ways paralleling Town Creek. The dominant species usually is *Panicum virgatum*, but can be replaced in patches by *Andropogon glomeratus*, *Carex emoryi*, *Sorghastrum nutans*, or *Tripsacum dactyloides*. In depressions of old channels, open patches often form between patches of the taller grasses where mats of *Muhlenbergia utilis* carpet the damp soil. Other associates include *Eleocharis montevidensis* and a mix of low frequency, water tolerant graminoids and forbs (especially the showy *Agalinis heterophylla* and *Sesbania drummondii*), while *Cynodon dactylon* and *Bothriochloa ischaemum* may be common on the edges of this community where it is near current or former pastures.