TULSA botanic GARDEN

A WALK IN THE WOODS

A Guide for the Identification of Plants Commonly Encountered Along the Nature Trail

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A Guide for the Identification of Plants Commonly Encountered Along the Nature Trail

by

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How to Use This Guide

Encompassing a variety of habitats, the site of the Tulsa Botanic Garden has a diversity of plants. This guide will introduce you to some of them, primarily the forest and grassland species characteristic of The Cross Timbers. It also will introduce you to species that are indicative of certain ecological conditions such as thin soils, watercourses, or disturbance.

As you follow the trail, stop periodically, and look at the common plants about you. Identify them by comparing their features to the illustrations and descriptions offered in the following pages. An illustrated glossary follows the descriptions to aid you in becoming familiar with the terminology used to describe and identify plants.

In addition to presenting the features that are used in recognizing individual species, each synopsis provides information about the ecology, and economic, wildlife, and/or ethnobotanical significance of the species. Unfortunately, space limitations prevent us from listing and illustrating all the species you are likely to encounter. We selected the most common species that are found along the trail and those that by their presence give the vegetation its characteristic appearance.

Enjoy your walk!

Oklahoma – A Botanical Crossroads

Biologically, Oklahoma is quite a remarkable state! It lies at the intersections of some of the most significant ecosystems of North America. The tallgrass prairie of the continent's center gives way to the shortgrass prairie of the west, the mesquite grassland of the southwest, and the deciduous forest of the east.

Within the state's borders, one can encounter ponderosa pine and other Rocky Mountain species at the end of the Panhandle; species characteristic of New England forests in the northeastern corner; stately bald cypress trees and other Gulf Coast species in the swamps of the extreme southeastern corner; and cacti and other species characteristic of the continent's southwestern deserts in the southwestern corner.

Within Oklahoma are found about 175 families, 850 genera, and 2,500 species of vascular plants. This diversity of plants and vegetation types is related to the state's tremendous ecogeographic diversity — variation in precipitation, temperature, geology, topography, and soils. From grasses to trees to cacti, Oklahoma has them all!

The Cross Timbers

Nowhere is this intersection between these different ecosystems more evident than in the Cross Timbers, a distinctive vegetation type that extends from southeastern Kansas across Oklahoma to north-central Texas. Tulsa Botanic Garden is situated in the midst of this remarkable ecosystem.

In the Cross Timbers, the tall trees of the continent's eastern deciduous forests do battle with the grasses of the central prairies, and thus form a mosaic of upland forests, tallgrass prairies, savannahs, and glades. Although the Cross Timbers forests contain many of the same species as found in the forests farther east, here the trees are reduced in stature, often stunted and gnarled.

In places these Cross Timbers forests are so dense, that many early travelers considered them impenetrable. In 1832 Washington Irving described traveling through them as "struggling through forests of cast iron," and it is reported that early wagon trains traveled to the north or south to avoid crossing them.

Fortunately, these distinctive features of the Cross Timbers that so vexed early travelers have left Oklahoma with one of its greatest botanical treasures. The Cross Timbers is one of the least disturbed forest types in the eastern United States because its trees were too stunted to be worth logging, its terrain too steep to be farmed, and its soil to thin and rocky to grow crops. Large tracts are essentially intact, and thus appear much the same and contain many of the same animals and plants as they did prior to the arrival of Europeans.

As you walk the nature trail of the Botanic Garden and pass among the trees of the post oak—blackjack oak forest and the grasses and forbs of the tallgrass prairie, think of the many travelers before you who likewise passed through this remarkable ecosystem.

Blackberry ***Rubus* spp.**

Shrubs forming thickets or brambles; stems arching, 1-2 m long, bearing stout prickles; leaves alternate, 1-pinnately compound; leaflets 3 or 5; flowers in clusters of 3-5; petals 5, free, white; stamens numerous; fruits round to cylindrical aggregates of black drupes.

Nine native species, but many hybrids. Native Americans used for food and medicinally to treat diarrhea and stomach aches. Important food producer for wildlife. Both cattle and deer browse stems and foliage.

Black Hickory ***Carya texana***

Tree; bark brown; branches stout, with heart-shaped leaf scars; leaves alternate, 1-pinnately compound; leaflets 5 or 7, blades elliptic to obovate, margins toothed; staminate flowers in catkins; fruits round nuts enclosed in slightly 4-winged husk.

Associated with post and blackjack oaks in Cross Timbers. Characteristic of dry, rocky, uplands. Firewood, not large enough for lumber. Starvation browse for white-tailed deer. Nuts eaten.

Black Willow ***Salix nigra***

Tree; bark brown, deeply furrowed; branches light brown; leaves alternate, blades lance-shaped, somewhat curved, toothed; flowers in catkins; seeds tiny, with tuft of hair.

Characteristic of sandbars, floodplains, edges of streams, ponds, reservoirs. Seed germination and establishment require wet, barren soils. Inner bark has precursor of salicylic acid (aspirin) used for headaches, fevers, and as anti-inflammatory. Wood used for crates, pulp, pallets. Good wildlife species: food, good honey plant.

Blackjack Oak, Blackjack ***Quercus marilandica***

Irregularly shaped tree; drooping dead branches; bark deeply furrowed; leaves alternate, glossy green, leathery, bell-shaped, with 3 lobes tipped with short bristles.

A dominant species of Cross Timbers. Dry rocky soils of ridge tops. Dense wood excellent for firewood and charcoal. Native Americans used bark to treat dysentery. Acorns eaten by birds, small mammals, and white-tailed deer. May cause oak toxicosis in cattle.

Buckbrush, Coralberry ***Symphoricarpos orbiculatus***

Shrub; forming low thickets; stems branched; bark gray-brown, shredding; leaves opposite, sessile or subsessile, blades oval or elliptic to round; flowers in dense clusters in upper leaf axils, white or pink; fruits purple-red, persistent.

Occurs in forest understory and at interface with prairie. Native Americans used bark, crushed leaves, fruits to make eyewashes, and teas for fevers and menstrual problems. Provides cover and food for wildlife, especially in winter.

Buttonbush, Honey-balls ***Cephalanthus occidentalis***

Shrub; leaves whorled and/or opposite, glossy green leaves; flowers in spherical clusters, white to cream, with long styles ending in spherical stigma.

Classic indicator of wetlands at edges of ponds, lakes, marshes, creeks, and intermittent streams. Flowering from May to September. Native Americans seeped inner bark to induce vomiting and to treat fevers, bronchitis, and venereal disease. Good wildlife species. Nectar and pollen for bees. Sometimes planted as ornamental.

Chittamwood, Gum Bumelia ***Bumelia lanuginosa***

Tree with stout thorns; leaves alternate or fascicled, oblanceolate, glossy-green borne in spurs; flowers small, greenish cream, in dense clusters; berries purplish black.

Solitary trees in open woods on rocky, thin soils in uplands or, in West, thicket forming in sandy soils. Native Americans used mucilage of outer bark as chewing gum. Berries edible. Occasionally planted as ornamental. Good wildlife and bee species.

Eastern Redcedar ***Juniperus virginiana***

Aromatic evergreen tree, pyramidal growth form; leaves scale-like; seed cones ("berries") blue; pollen cones small, yellow-green. dioecious.

Fire suppression allows its invasion into prairies, old fields, pastures. Native Americans used in purification rituals and to cure mouth sores, head colds, coughs, kidney problems, nervous problems, and other ailments. Settlers used for fence posts, roof rafters, and windowsills. Aromatic wood repels insects; used for closets and chests. Good wildlife species.

Fragrant Sumac, Skunkbush ***Rhus aromatica***

Thicket-forming shrub; fragrant or malodorous when crushed; branches dark reddish brown; leaves alternate, palmately compound, leaflets 3; flowers appear before leaves, yellow; fruits clustered, bright red, glandular-hairy. May be mistaken for poison ivy, but strong odor diagnostic.

Native Americans used all parts medicinally; fruits, high in Vitamin A, used for food and lemonade-like drink; branches woven in baskets. Good wildlife species; twigs, leaves, fruits eaten; provides cover for birds and small mammals.

Green Ash ***Fraxinus pennsylvanica***

Tree with bark furrowed in Ys; leaf scars broad Us with axillary bud above; leaves opposite, 1-pinnately compound; leaflets 7 or rarely 5 or 9; staminate flowers in dense clusters; fruits oblanceolate samaras; dioecious.

Floodplains and moist soils of slopes. Sacred tree for many Native American tribes; bows, arrowshafts, toys. Now used as ornamental, in wind breaks, and for sporting equipment, cabinetry, veneer, firewood. Wildlife eat fruits and foliage.

Greenbrier, Catbrier ***Smilax bona-nox***

Woody vine with tendrils and stout prickles; stems green, angular, climbing; leaves alternate, leathery, heart- to egg-shaped; flowers small, yellowish green; berries shiny black.

Often forming dense tangles or thickets in disturbed sites or forest edges. Difficult to manage unless burned frequently. Settlers broke plows and harnesses on rootstalks. Young stem tips eaten like asparagus; powdered rootstocks used in making jelly, thickening soup, or mixed with water to make a refreshing drink. Excellent wildlife species.

Hawthorn ***Crataegus* spp.**

Small solitary trees or in thickets; thorns present or absent; leaves alternate, of various shapes, margins toothed and/or lobed; flowers clustered on side branches; petals 5, white; stamens 20; fruits round, red to blue-black pomes.

Seven native species, but numerous hybrids. Native Americans used roots for back pain and as gynecological aid. Characteristic of disturbed sites and early plant succession. Used for jelly, tea, tool handles, mallet heads. Birds and small mammals eat pomes. Browsed slightly.

Osage Orange, Bowood Hedgeapple ***Maclura pomifera***

Tree; sap milky; inner bark orange-yellow, stout thorns; leaves glossy, dark green; fruits large, yellow-green balls; dioecious.

Native to Red River drainage; now widely planted in windbreaks, hedgerows, woodlots. Extremely hard wood prized for fence posts. Fast-growing; aggressive. Native Americans used wood for bows, war clubs, dyeing and tanning. Aromatic fruits repel insects; seeds eaten by small mammals and birds.

Persimmon ***Diospyros virginiana***

Tree; bark dark, with square plates; leaves dark green, glossy, somewhat folded, droop in two rows; berries yellow-orange, persisting after leaves drop; dioecious.

Solitary or forming dense thickets of spindly trees. Weedy; infests overgrazed pastures, old fields, and abandoned croplands. Native Americans and settlers used for food and medicine. Pulp mashed, dried, and used as additive. Leaves used for teas. Golf club heads. Important wildlife species.

Plum ***Prunus* spp.**

Small solitary trees or thicket-forming shrubs; leaves alternate, egg- to lance-shaped or oblong, margins toothed, petioles with 1 or 2 large glands; flowers showy, solitary or clustered; petals 5, free, white; stamens numerous; fruits large, red or yellow red to purple-black.

Ten native species. Both forests and prairies; in variety of soils. Native Americans and settlers seeped roots to make vermifuges, washes for abrasions, mouthwashes for sores, cough medicines. Fruits edible. Provides wildlife cover.

Post Oak ***Quercus stellata***

Tree; bark light gray, flaking; leaves alternate, glossy green, leathery, cross-shaped, with rounded lobes, and dense covering of stellate hairs on lower surface.

A dominant of Cross Timbers. Across state with exception of northwest corner and Panhandle. Dry, sterile, upland soils or sands in West. Dense wood good for firewood and charcoal. Important acorn producer for birds. small mammals, and white-tailed deer. May cause oak toxicosis.

Poison Ivy ***Toxicodendron radicans***

Woody vine or herb or shrub from rhizomes; stems reddish brown; climbing by masses of aerial roots; leaves alternate, 1-pinnately compound; leaflets 3, egg- to lance-shape, margins entire or toothed or lobed; flowers small, greenish white; fruits round, white or cream or whitish tan.

Typical of disturbed sites. Causes contact dermatitis with a characteristic itching, reddening, and blistering of the skin. Native Americans used crushed leaves to cure ringworm. Good wildlife species; fruits eaten by birds; foliage by deer.

Redbud ***Cercis canadensis***

Tree; bark dark; leaves alternate heart- or kidney-shaped; flowers pink or white, clustered, butterfly-like; fruits flat, elliptic, light brown.

Understory species of moist open woods. One of earliest spring flowering species; fast-growing; short-lived. State tree; widely cultivated. Flowers may be fried or used as salad garnish; legumes sautéed in butter. Good humus builder. Moderate wildlife use; considered emergency food for limited number of species.

Rough-leaf Dogwood ***Cornus drummondii***

Thicket-forming shrub; twigs reddish brown; leaves opposite, elliptic, rough-surfaced; flowers cream-white; in flat-topped arrangements; fruits white.

Classic indicator of openings in woods and interface between prairie and forest. Flowering late April to early June. Native Americans used for arrow shafts, chew-sticks, and remedies for diarrhea, toothaches, and aching muscles. Provides cover and browse for wildlife species.

Rusty Black Haw, Nanny-Berry ***Viburnum rufidulum***

Small, tree or large shrub; twigs and buds rusty-brown hairy; leaves opposite, leathery, shiny, lower surfaces rusty-brown and woolly; flowers in flat-topped or hemispheric clusters, white to cream; fruits dark blue to purple-black, persistent in winter.

Understory species of upland and bottomland forests. Native Americans used root bark infusions as tonics and gynecological aid. Sweet fruits edible, made into jelly; relished by wildlife. Twigs and leaves browsed somewhat.

Sugarberry, Southern Hackberry ***Celtis laevigata***

Tree with light gray, warty bark; leaves alternate, lance-shaped, thin, leathery, with long acuminate tips, 3 nerves, oblique bases; fruits solitary in leaf axils.

Moist soils of floodplains and lower slopes, but drought resistant in upland sites. Native Americans and settlers ate sweet fruits raw, dried, or mixed with fat, meat, or bread. Planted for shade; wood used for furniture framing, crates, and athletic goods. Excellent for wildlife.

Virginia Creeper ***Parthenocissus quinquefolia***

Woody vine; stems high-climbing, reddish brown; tendrils branched with terminal pads; leaves alternate, palmately compound, leaflets typically 5 (3-7) with toothed margins; flowers small, green; berries black or blue-black.

Forms large masses in tree crowns. Prized for bright red or scarlet foliage in autumn. Sometimes mistaken for poison ivy. Excellent species for wildlife; berries, leaves, and stems eaten. Causes digestive tract problems in humans.

Winged Elm, Cork Elm, Wahoo ***Ulmus alata***

Fast-growing tree; branches slender, gray, with 2 flat, corky wings; leaves alternate, 2-ranked, blades elliptic to egg-shaped, margins double-toothed; bases asymmetrical; fruits flat, egg-shaped, brown, with white fringe of hairs.

In both upland and bottomland communities. Native Americans and settlers seeped inner bark to make teas to control diarrhea and ease childbirth. Fibers of inner bark woven into baskets and rope. Important wildlife species; twigs and foliage browsed; buds and fruits eaten.

Winged Sumac, Shining Sumac ***Rhus copallinum***

Thicket-forming shrub; sap milky; branches stout, reddish-brown; with fine brown hairs; leaves alternate, 1-pinnately compound; leaflets 9-21, green above and below, margins not toothed-green below, margins not toothed, rachises winged; flowers clustered; fruits bright-red, glandular-hairy.

Typically in open sites and interface between forest and prairie. Native Americans used all parts medicinally; fruits used for food and lemonade-like drink. Good wildlife species; provides cover and food.

Annual Broomweed ***Gutierrezia dracunculoides***

Annual composite from taproot; stems erect, unbranched below and branched above, 1-3 feet tall; leaves alternate, narrow, sessile; heads numerous, small, yellow, ray florets 6-10, disk florets 10-50.

Classic indicator of disturbance typically forming large populations in barren soil of waste areas, rights-of-way, overgrazed pastures. Unpalatable to livestock. Plant and pollen may cause dermatitis. Used in dried floral arrangements and architectural models.

Catclaw Sensitivebriar ***Mimosa quadrivalvis***

Perennial legume; ribbed stems 1.5-5 feet long, trailing or arching from woody taproot, with stout curved prickles; leaves alternate, 2-pinnately compound, leaflets many, fold when touched; flowers small, pink or rose-purple, in ball-like cluster; stamens elongated; fruits 4-sided, prickly.

Solitary plants or small populations in prairies and open woods; becomes abundant in disturbed soils. Birds and small mammals eat seeds to limited extent; Cattle and deer occasionally eat young branches and leaves.

Goldenrods ***Solidago* spp.**

Perennial composites from rhizomes or branching crowns; stems erect, 1-6 feet tall; leaves alternate, simple; heads numerous, small, cylindrical to bell-shaped, yellowish, typically borne on branch sides; ray and disk florets yellow.

Twenty-one native species in prairies, open forests, and disturbed sites. May form large populations. Athough insect pollinated, they are mistakenly blamed for hay fever because they flower at same time as the ragweeds. Wildlife eat young plants and fruits.

Heath Aster, White Prairie Aster ***Aster ericoides***

Rhizomatous perennial composite forming small clones; stems 2-3 feet tall; leaves alternate, small, stiff, linear; heads many, borne on 1 side of arching branches, with 8-20 white ray florets and 4-15 yellow disk florets.

Normal component of prairies, also in old fields, waste areas, and edges of open woods. Typically last of asters to flower in autumn. Native Americans used to produce smoke for sweat baths or to revive unconscious individuals.
Wildlife eat plants; when abundant provides cover for quail.

Lanceleaf Ragweed ***Ambrosia bidentata***

Annual composite; stems 1-3 feet tall from large taproots; leaves alternate, sessile, lance-shaped with 2 basal lobes; heads of 2 types; staminate borne in terminal spikes; pistillate heads forming hardened burs in upper leaf axils.

Classic indicator of disturbance, especially heavy grazing. Pollen causes severe hay-fever in many humans, can be dangerous to especially sensitive individuals. Songbirds and upland game birds eat achenes, but species less important for wildlife than western and common ragweed.

Leadplant ***Amorpha canescens***

Silvery-gray, perennial legume; stems 1-4 feet tall; leaves alternate, 1-pinnately compound with 13-24 leaflet pairs; flowers bright purple or violet, borne in dense racemes at branch ends; fruits 1-seeded, plump, gland-dotted.

One of most important prairie legumes; nutrient content high; readily eaten by livestock and its abundance an indicator of range condition. Native Americans used as beverage, for smoking, and as a treatment for eczema, pinworms, stomach pain, rheumatism, and neuralgia.

Plains Wild Indigo ***Baptisia bracteata***

Perennial legume; stems branched, 1-2 feet tall; leaves alternate, palmately compound, leaflets 3; flowers yellowish or cream-white, butterfly-like, borne on elongated axes at ends of branches; fruits plump, gray or black.

Scattered plants or small populations in prairies and open woods. Native Americans made infusions from roots, decoctions from leaves, salves from seeds for various ailments. Fruits used for rattles. Limited value for wildlife.

Prairie Petunia, Wild Petunia ***Ruellia humilis***

Coarsely hairy perennial from short knotty rhizomes; stems branched, 4-sided, 0.75-1.5 feet tall; leaves opposite, egg- to lance-shaped; flowers borne in leaf axils, funnelform, petals 5, fused, light blue or lavender; fruits tan or dark brown, with long style persistent at apex.

Solitary plants in prairies and open upland forests. Abundance increases after fire. Prairie chickens, wild turkey, and songbirds eat seeds. White-tailed deer and rabbits browse occasionally.

Pussy-toes ***Antennaria parlinii***

Perennial composite from short rhizomes or stolons; stems woolly white, 4-12 inches tall; leaves forming basal rosettes of spatula-shaped leaves; heads whitish, small, clustered at ends of stems, with stamens or styles protruding.

Classic indicator of shaded forest floor. Typically forming large localized populations. Native Americans and settlers used medicinally for dysentery, bruises, inflammations, tumors, snake bites, respiratory congestion, problems of childbirth, bowels, and liver. Wildlife eat rosettes of leaves.

Slender Bush Clover ***Lespedeza virginica***

Perennial legume from woody rootstocks; stems long, with crowded leaves on spreading branches; leaves alternate, 1-pinnately compound, leaflets 3; flowers small, butterfly-like, purple to pink, borne on short stalks in leaf axils; fruits flattened, 1-seeded.

Individual plants or small, scattered populations in prairies, open woods, and sandy stream valleys. Good wildlife species with fruits, stems, and leaves eaten. Cattle also relish; abundance decreases with heaving grazing.

Tickclovers, Beggar's Lices ***Desmodium* spp.**

Perennials; stems erect, with hooked hairs; leaves alternate, 1-pinnately compound, leaflets 3; flowers butterfly-like, pink or red-purple or lavender, borne on elongated axes at ends of stems; fruits flat, constricted into 2-8 1-seeded segments, covered with hooked hairs.

Fourteen native species. Fruit segments break apart at maturity and cling to clothing, skin, or fur. Both deer and cattle readily eat. Birds and small mammals eat nutritious seeds. Bees visit for nectar.

Western Ragweed ***Ambrosia psilostachya***

Perennial composite often forming extensive clones; stems 1-2 feet tall; leaves gray-green, sessile, both opposite and alternate; heads of 2 types; staminate borne in terminal spikes; pistillate heads forming hardened burs in leaf axils.

Classic indicator of land use; normal component of prairies, but increases with heavy grazing. Native Americans brewed leaves to relieve intestinal cramps, diarrhea, sore eyes. Pollen causes severe hay-fever, can be dangerous to sensitive individuals. Important food source for birds.

Big Bluestem, Turkeyfoot ***Andropogon gerardii***

Tall, perennial; stems solitary or small bunched, 3-8 feet tall; leaf blades flat, 1/4-1/2 inches wide, sparsely hairy; flowers in spikelets; spikelets paired, borne on 2-7 (typically 3) branches at ends of long stalks near ends of stems.

One of the four dominant species of tallgrass prairie. Characteristic of late stages of plant succession. Adapted to fire and grazing. Decreases with soil disturbance. Increases with fire. Produces high quality hay. Provides food and cover for wildlife.

Broomsedge Bluestem ***Andropogon virginicus***

Perennial bunchgrass; straw-yellow or yellow-brown; stems1-3 feet tall; leaf blades flat or folded, 1/8-1/4 inches wide; flowers in spikelets; spikelets partially hidden in clusters of leaves, branches, and long hairs arising near tops of stems.

Classic indicator of soil disturbance, poor land management, and fire suppression in fall. Seldom eaten by livestock, except when other forage scarce. Provides cover for birds and small mammals when dense.

Fish-on-a-Fishing-Pole Grass ***Chasmanthium latifolium***

Rhizomatous, clone-forming, perennial; stems 2-3.5 feet tall; leaf blades flat, 1/4-3/4 inches wide; spikelets strongly flattened, borne at ends of long slender drooping branches.

Classic indicator of shaded moist soils of stream bottoms or lower slopes. Principal use in dried floral arrangements or as shaded border plant. Quail, turkey, and songbirds eat small amounts of caryopses. Not important forage for cattle.

Canada Wildrye ***Elymus canadensis***

Rhizomatous, perennial; stems 2-4 tall; leaf blades flat, 1/4-3/4 inches wide; spikelets borne in dense, cylindrical bristly spike that nods to one side at ends of stems.

Typically encountered in open sites in prairies or along streams or in disturbed area. Minor component of Oklahoma's tallgrass prairie. Growth begins in autumn with flowering in early summer. White-tailed deer occasionally eat stems and leaves; use by other wildlife not reported.

Nimblewill ***Muhlenbergia schreberi***

Perennial bunchgrass; stems slender, 1-2 feet tall, bent and rooting at lower nodes; leaf blades1/8-1/4 inches wide; spikelets small, each with long bristle, borne on slender overlapping branches of narrow panicles.

Characteristic of shaded soils of open woods and bottomlands. When abundant may provide some cover for small mammals. Quail, turkey, and a few songbirds occasionally consume caryopses.

Switchgrass ***Panicum virgatum***

Rhizomatous, clone-forming perennial; stems 2-5 feet tall; leaf blades long, curled or twist, flat, 1/4-3/4 inches wide, with triangular tuft of hairs at base; spikelets round, pointed, borne at ends of stiff, ascending and spreading branches in open panicles.

One of the four dominant species of tallgrass prairie. Palatable and nutritious for livestock; produces good quality hay if cut before maturity. Several hay varieties developed. Wild mammals eat stems and leaves in spring and after fire. Birds eat caryopses.

Florida Paspalum ***Paspalum floridanum***

Robust, perennial, from short knotty rhizomes; stems 2-5 feet tall; leaf blades long, flat, 1/4-3/4 inches wide; spikelets large, box- turtle shaped, borne in pairs on one side of elongate axes near tips of stems.

Characteristic of moist sites in tallgrass prairie and open woods. Palatable and readily grazed by livestock. Whitetailed deer, rabbits, and small mammals consume stems and leaves to a limited extent. Shorebirds, upland game birds, and songbirds eat caryopses.

Little Bluestem ***Schizachyrium scoparium***

Perennial sod-forming or bunchgrass; stems reddish bluegreen, 1.5-4 feet tall, strongly flattened at bases; leaf blades flat or folded, narrow, long; spikelets borne on single branch at ends of numerous stalks arising along stems.

One of the four dominant species of tallgrass prairie; also present in almost all communities across state. Adapted to fire. Graze resistant. Provides cover for ground nesting birds and small mammals. Important component of prairie hay. Used to cover strip mine spoils.

Knotroot Bristlegrass ***Setaria parviflora***

Perennial from short, knotty rhizomes; stems 1.5-3 feet tall; leaf blades flat, 1/4-1/2 inches wide; spikelets borne in dense, cylindrical, bristly panicles, each with 4-12 long bristles partially hiding it.

Characteristic of early stages of plant succession. Best growth in moist or wet sites. Indicator of soil disturbance. Caryopses important food for many songbirds, upland game birds, and small mammals.

Indiangrass ***Sorghastrum nutans***

Perennial from short scaly rhizomes; stems and leaves blue-green; stems 3-6 feet tall; leaf blades flat, 1/4-3/4 inches wide, constricted at base; sheaths with 2 triangular "ears" at top; spikelets solitary, borne in soft golden asymmetrical panicles.

One of the four dominant species of tallgrass prairie, and key management species. Provides high-quality forage when green. Cut for hay. Major component of seed mixtures for prairie restoration.

Purpletop, Greasegrass ***Tridens flavus***

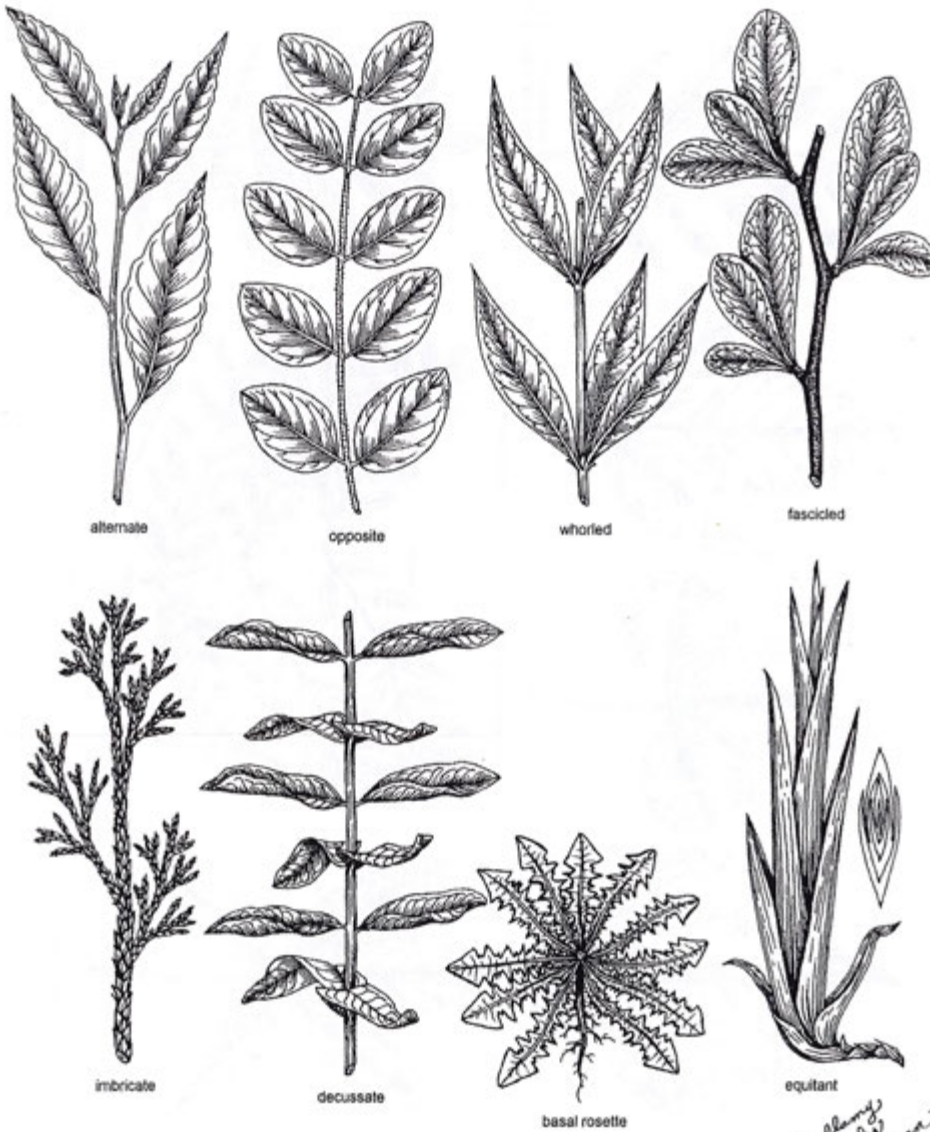
Perennial bunchgrass from knotty base; stems 2-5 tall; leaf blades dark green, flat or curled, 1/4-1/2 inches wide; spikelets purple, flattened, borne at ends of spreading or drooping branches of panicles at end of oily/greasy stem.

Occupies variety of sites from rocky, uplands to bottomlands. Increases in abundance with moderate disturbance, heavy grazing. Not palatable to livestock until after frosts in autumn. Small mammals eat plants. Wild turkey and ground-feeding songbirds eat caryopses.

Longspike Tridens ***Tridens strictus***

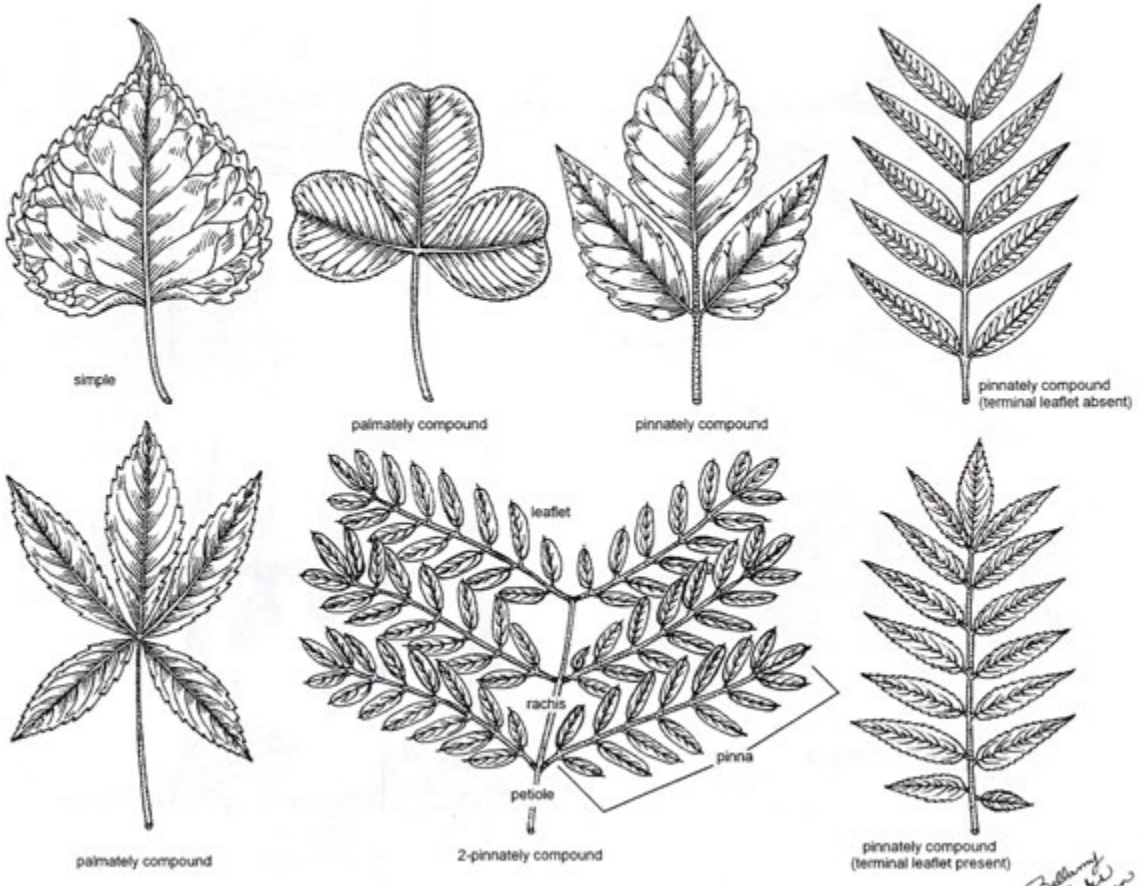
Perennial bunchgrass; stems 2.5-5 feet tall; leaf blades flat or curled, 1/8-1/2 inches wide; spikelets borne in dense cylindrical panicles that are dark brown when mature.

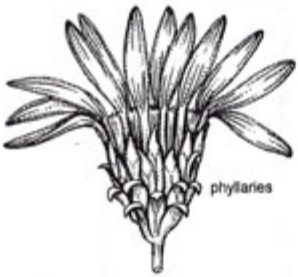
Often forms large populations in moist sites of prairies and open, lowland woods. Growth begins in early spring with flowering in autumn. Small mammals eat limited amounts; other wildlife and livestock apparently do not eat. Songbirds occasionally eat the caryopses.



Leaf Arrangement

Blade Dissection

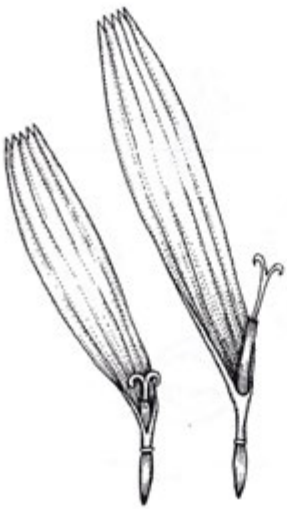




lateral view

Stylized Heads

three-quarter view



ligulate florets

disk floret

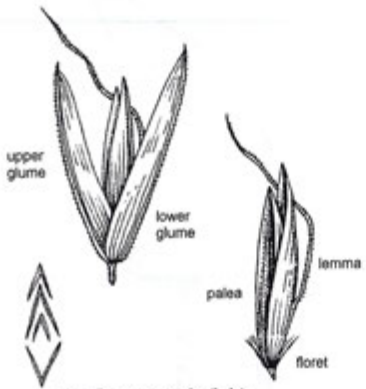
ray florets

pistillate neutral

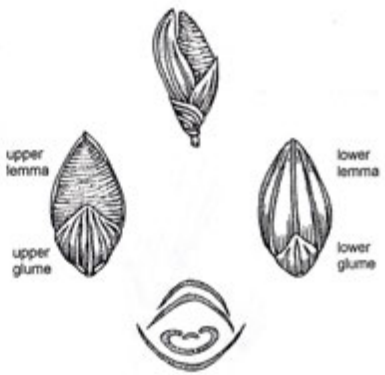
Morphology & Floret Types of Composite Heads

laterally compressed spikelet with 13 florets

terete spikelet with 1, apically awned floret



laterally compressed spikelet with 1, dorsally awned floret



dorsally compressed spikelet with 2 florets

Bellamy Parker Duncan ©2001

Morphology of Grass Spikelets

acorn – fruit comprising nut and basal cup of fused bracts (cap); characteristic of *Quercus* (oak).
alternate – arrangement of organs such as leaves, branches, flowers, or fruits one per node.
annual – plant that completes its life cycle in one growing season.
aromatic – with conspicuous fragrant, spicy, or pungent odor.
awn – bristle-like appendage extending body of organ, usually at tip or from dorsal surface.
axil – upper angle formed between axis and organ arising from it; e.g. between leaf and stem.
basal – attached or situated at base of plant or organ.
berry – fleshy, indehiscent fruit derived from 1 pistil and having a pulpy or fleshy wall; e.g. grape or tomato.
browse – to eat selective parts of a plant, especially young shoots and twigs.
bunchgrass – grass growing in dense clumps or multi-stemmed tufts.
bur – fruit or other structure with a rough or prickly covering derived from fruit wall, or persistent flower parts or bracts.
caryopsis – in Poaceae (grass family), dry, indehiscent, 1-seeded fruit with seed coat fused to fruit wall; synonym is grain.
catkin – arrangement of flowers comprising unisexual flowers without petals; the entire arrangement typically dropping as unit.
clone – population of individuals derived asexually.
clustered – organs or structures positioned closely together, with specific arrangement not discernable.
composite – generalized common name for any member of the Asteraceae or sunflower family.
compound – organ divided into or composed of two or more similar parts; e.g., compound leaves or compound pistils.
compressed – (1) flattened in one plane; (2) in Poaceae (grass family), two types recognized: lateral—spikelets flattened along margins (sides) of glumes and lemmas; and dorsal—spikelets flattened along midnerves (backs) of glumes and lemmas.
crown – (1) base of tufted, herbaceous perennial where shoot and root systems merge; (2) overall appearance or form of branches of tree or shrub.
deciduous – (1) not persistent, falling when no longer functional; e.g., leaves falling in autumn or floral parts after flowering; (2) plant that drops all of its leaves annually.
decoction – extract prepared by placing plant parts, usually roots, bark, twigs, or berries, in cold water, bringing water to a boil, and then simmering for a length of time; *cf.* infusion.
decussate – arranged in pairs with each pair at right angles to pair above and below.
dehiscent – splitting open at maturity to release contents.
dermatitis – inflammation of the skin.
disk floret – flower of composite head comprising 5 fused petals and highly modified sepals
dioecious – pistillate and staminate flowers borne on different plants; *cf.* monoecious.
diuretic – tending to increase secretion and discharge of urine.
dominant – organism or species exerting influence upon community because of its size, abundance, aerial coverage, or other feature.
dorsal – (1) pertaining to or located on back; (2) abaxial surface of organ; (3) in Poaceae (grass family), one type of compression, with spikelets flattened along midnerves (backs) of glumes and lemmas.
drupe – fleshy, 1-seeded, indehiscent fruit with seed enclosed in hard or papery endocarp called the pit or stone; e.g., *Prunus persica* (peach).
ecogeography – study of how climatic, physiographic, geologic, and edaphic features determine distribution of species, communities, and vegetation types.
ecosystem – natural unit comprising all plants, animals and microorganisms in an area that are interacting with each other and their physical environment.
elliptic – ellipse-shaped; broadest at middle and narrowed at rounded ends.
elongate – lengthened; stretched; extended.
emetic – substance causing vomiting.
entire – margin continuous and without teeth or divisions.
equitant – folded leaves overlapping lengthwise in two rows; e.g., *Iris* (iris).

erect – upright or perpendicular to surface; vertically oriented.
ethnobotany – study of how people and/or culture of an area make use of indigenous plants.
evergreen –(1) plants having foliage that remains green for more than one growing season and not falling *en mass*; (2) never lacking green leaves; (3) remaining green through winter.
expectorant – facilitating discharges of mucus.
fascicle – tight cluster or bundle of organs; appearing to arise from a common point.
fascicled – borne in clusters or bundles.
flora – collective term for all of the plants in an area; *cf.* vegetation.
floret – (1) in Asteraceae (sunflower family), one flower of a composite head with 5 fused petals, a highly modified calyx, 5 stamens fused by their anthers, and an inferior ovary; three types recognized: disk, ray, and ligulate; (2) in Poaceae (grass family), flower and two associated bracts known as lemma and palea; subunit of grass spikelet.
flower – determinate shoot axis bearing sepals, petals, stamens, and carpels in spiral or whorls; reproductive organ of flowering plants.
foliage – collective term for leaves of plant.
forage – plant material consumed by herbivores.
forb – any broadleaf herbaceous plant (dicot).
forest – vegetation type dominated by trees whose crowns typically form a continuous or almost continuous canopy; *cf.* woodland.
free – separate; not fused nor attached to another organ.
fruit – mature ovary or ovaries plus any structures maturing with it after fertilization.
funnelform – funnel-shaped; corolla tube widening gradually upward toward apex; e.g., many flowers of *Convolvulus* (morning glory).
fused – parts or organs joined to one another.
gland – (1) appendage, protuberance or depression on surface of organ or at end of hair that secretes usually sticky fluid; (2) protuberance which may not be secretory; e.g., warty swelling at base of leaf blade in *Prunus* (plum).
grass – generalized common name for any member of the Poaceae or grass family.
grassland – vegetation type dominated by perennial grasses and with few or no trees or shrubs; *cf.* prairie.
graze – (1) to eat almost the entire aerial portion of a plant; (2) to eat plant close to ground.
habit – general appearance of plant; may refer to single character or collectively to all characters.
habitat – environmental conditions or type of area normally occupied by plants of a species and characterized by set of physical, chemical, and biotic features, e.g., sandbar, borrow ditch, or forest clearing.
head – in Asteraceae (sunflower family), dense spherical, hemispheric, or flat-topped arrangement of sessile flowers borne on a common receptacle and subtended by modified leaves.
herb – plant with non-woody aerial stems that die at end of growing season.
herbage – (1) collective term for the stems and leaves of a plant; (2) total plant biomass available to an herbivore.
herbivore – animal that feeds on plants.
husk – covering, derived from petals or sepals or modified leaves, that encloses fruit.
imbricate – partial overlapping of organs so as to resemble shingles on a roof.
infusion – extract prepared by pouring hot water over plant parts, usually leaves and flowers, and allowing to sit for period of time; *cf.* decoction.
introduced species – species occurring in an area due to human activity; not indigenous; *cf.* native, naturalized.
lateral – (1) on or at side of axis or organ; (2) in Poaceae (grass family), one type of compression, with spikelets flattened along margins (sides) of glumes and lemmas.
leaf – lateral appendage arising from stem at node and typically subtending axillary bud; comprising blade, petiole, and stipules; having primary functions of photosynthesis and transpiration. (*pl.* leaves)
leaflet – single segment of a compound leaf.

legume – generalized common name for any member of the Fabaceae or pea family.
lemma – in Poaceae (grass family), outer and generally larger bract of two subtending flower; one of two bracts of floret.
linear – long and narrow with margins parallel or nearly so.
malodorous – with disagreeable odor.
margin – edge or border of organ.
monoecious – pistillate and staminate flowers borne on same plant; *cf.* dioecious.
native species – taxon occurring naturally in an area; presence not due to human activity; indigenous; *cf.* introduced, naturalized.
naturalized species – introduced taxon established in an area and growing and reproducing as if it is a native; *cf.* adventive, native.
neutral – flower lacking functional stamens and pistils; organs may be present, but are sterile and do not produce spores and gametophytes.
node – point on stem where leaf/leaves, branch/branches, or flower/flowers originate.
nut – dry indehiscent, usually 1-loculed, 1-seeded fruit derived from compound ovary with bony, woody, leathery, or papery pericarp and partially or wholly enclosed in modified leaves (bracts).
ob – Latin prefix indicating inversion of shape and attached to adjectives.
oblanceolate – lance-shaped; rather narrow, tapering to both ends with broadest part above middle
obovate – egg-shaped, but attached at narrower end.
oblong – rectangular but with rounded ends; 2-3 times longer than broad and sides nearly parallel.
opposite – arrangement of organs such as leaves, branches, flowers, or fruits two per node.
ovary – basal portion of pistil containing ovules and maturing into fruit after fertilization.
ovate – egg-shaped in 2 dimensions and attached at broader end; applied to plane surfaces.
ovoid – egg-shaped in 3 dimensions; applied to solids.
palea - in Poaceae (grass family), inner and generally smaller bract of two subtending flower; one of two bracts of floret.
palmately compound – with 2 or leaflets radiating from the petiole apex; resembling fingers spreading from palm of hand.
panicle – branched arrangement of flowers comprising a central axis, 1-several series of branches, and individual stalks bearing flowers.
perennial – (1) plant whose life cycle takes 3 to many growing seasons to complete; (2) continuing to live from year to year.
perfect – flowers having both stamens and pistils present.
petal – one member of second whorl of floral organs; typically colored and showy.
petiole – stalk of leaf connecting blade and stem node.
phyllary – in Asteraceae (sunflower family), modified leaf (bract) subtending florets of head.
pinna – one of the primary divisions of a pinnately compound leaf.
pinnately compound – compound leaf with leaflets borne in 2 rows along an axis; if 1-compound, leaflets attached to rachis; if 2- or 3-compound, leaflets attached to secondary or tertiary axes.
pistil – innermost floral organ; normally differentiated into ovary, style, and stigma; female organ.
pistillate – flower bearing pistil or pistils, but lacking functional stamens.
pollen – mature microspores or developing microgametophytes in seed plants.
pollination – (1) in flowering plants, transfer of pollen from anther to stigma of pistil; (2) in gymnosperms, transfer of pollen from pollen-producing cone directly to ovule.
pome – fleshy, indehiscent fruit derived from a compound pistil with an inferior ovary surrounded by receptacular tissue and enclosing seeds within papery or cartilaginous endocarps; e.g., *Malus* (apple).
population – individuals of a species that occupy an area at the same time and typically isolated to some degree from other groups.
prairie – tract of grassland, with types often distinguished on basis of dominant grasses present, e.g., tallgrass, shortgrass, mixed-grass; *cf.* grassland.
prickle – small, spine-like outgrowth of bark or epidermis.
pyramidal – pyramid-shaped; tetrahedral.
rachis – central axis of compound leaf or compound inflorescence; bearing flowers or leaflets.

ray floret – in Asteraceae (sunflowers), pistillate or neutral floret with strap-shaped corolla.
rhizome – horizontal underground stem producing aerial stems and leaves along its length or at end; scale leaves present or absent.
root – descending axis of plant; growing opposite stem; without nodes and leaves, typically developing underground; having primary functions of anchorage and absorption of water and nutrients.
rootstock – woody, underground stem base and/or root apex giving rise to aerial growth each growing season.
rosette – cluster of leaves radiating from common center or crown; usually at or near ground level or rarely at stem apex.
samara – winged, dry, indehiscent, 1-seeded, achene-like fruit; e.g., *Ulmus* (elm) and *Fraxinus* (ash).
savannah – vegetation type comprising a dense, continuous layer of grasses with scattered trees or shrubs having a cover of less than 30%.
scar – (1) mark or indentation left on stem by separation of leaf or bud scale; (2) mark or indentation on seed when it detaches.
seed – multicellular structure developing from ovule after fertilization; typically comprising embryo, seed coat, and storage tissue such as endosperm.
sepal – one member of outer most whorl of floral organs; typically green; leaf-like or petaloid.
sessile – stalkless; attached directly at the base, as leaf without petiole.
shrub – woody plant with multiple stems from base but lacking a single trunk.
simple – organ not divided into distinct parts or segments; not compound; e.g., leaf with undivided blade or pistil with one carpel; *cf.* compound.
spike – inflorescence consisting of central rachis bearing one or more sessile flowers.
spikelet – in Poaceae (grass family), highly modified inflorescence typically consisting of two glumes, one or more florets, and rachilla [
spine – (l) sharp, stiff projection from stem; a modified leaf or stipule; *cf.* thorn.
stalk – general term for any supporting or connecting structure such as petiole, peduncle, pedicel, filament, or stipe.
stamen – floral organ producing pollen and normally consisting of filament and anther. **staminate** – flower bearing stamens but lacking functional pistil.
stem – ascending axis of plant which bears and supports leaves, flowers and fruits; growing opposite root; with nodes; typically developing above ground.
stigma – portion of pistil which receives pollen; typically at end of style. (*a.* stigmatic)
style – slender stalk connecting stigma to ovary.
succession – gradual and somewhat predictable progression of changes in community composition that occurs during development of vegetation in an area over time; (2) progressive changes in vegetation from initial colonization to climax typical of the area; (3) the process of continuous colonization and extinction of species
taproot – persistent, well-developed primary root, generally larger than secondary roots that arise from it..
taxon – general taxonomic term for any group of plants at any rank. (*plural* taxa)
tendril – rotating or twisting thread-like process or extension by which a plant grasps an object for support; morphologically it may be a modified stem, leaf, leaflet, or stipule.
terete – (1) cylindrical; (2) round in cross-section.
thicket – thick, dense growth of shrubs or woody vines or small trees.
thorn – stiff, woody, modified stem with sharp point; *cf.* spine.
trailing – prostrate or creeping but not rooting.
tree – perennial woody plant of considerable stature at maturity with one main stem (trunk); generally branching well aboveground and exhibiting well developed crown.
vegetation – plant cover of an area defined in terms of species dominating landscape, e.g., deciduous forest, grassland, desert; *cf.* flora.
vine – climbing or scrambling plant with elongate, flexible, non-self supporting stems.
weed – plant species which aggressively colonizes disturbed habitats and cultivated lands.
whorl – arrangement of organs such as leaves, branches, flowers, or fruits three or more per node.
woodland – (1) vegetation type dominated by trees, but whose crowns do not touch; (2) forest with open canopy; *cf.* forest, savannah.