# A FLORISTIC INVENTORY OF THE JOHN W. NICHOLS SCOUT RANCH, CANADIAN COUNTY, OKLAHOMA

**Abby Crosswhite**
**Adam K. Ryburn**
**Department of Biology**
**Oklahoma City University**
**OKC, OK 73106**
aryburn@okcu.edu

*Keywords: vascular flora, biodiversity, invasive species, upland forest*

## ABSTRACT

We conducted a vascular plant survey of the John Nichols Scout Ranch in southeastern Canadian County, Oklahoma, during the growing seasons of 2017 to 2019. Vouchered specimens were collected for 152 species in 116 genera and 49 families. The largest families represented were the Asteraceae (37 species), Poaceae (19), and Fabaceae (17). No rare species currently being tracked by the Oklahoma Natural Heritage Inventory were encountered. Twenty of the species collected were not native to the United States, of which six (*Lonicera japonica*, *Lespedeza cuneata*, *Bothriochloa ischaemum*, *Bromus tectorum*, *Sorghum halepense*, and *Tamarix chinensis*) are considered invasive. Three tree species (*Pinus taeda, Pistacia chinensis*, and *Taxodium distichum*) were planted in developed areas of the ranch. Species richness appears to be low when compared to surveys of similar size. We suggest that the adjacent properties used for agriculture and housing development have influenced the number of species of this suburban wilderness.

## INTRODUCTION

E. O. Wilson writes in his book *Biodiversity* (1988) that "biological diversity must be treated more seriously as a global resource, to be indexed, used, and above all, preserved." In partnership with the Last Frontier Council of the Boy Scouts of America, the Oklahoma City University Department of Biology began a project to explore the biodiversity of a 150-hectare (371-acre) suburban wilderness in southwest Oklahoma City known as the John Nichols Scout Ranch (JNSR). Managed by the Last Frontier Council, very little is known of the biodiversity of this suburban natural area that is surrounded by agriculture and housing developments. As protected lands such as the JNSR become the refuges of biodiversity, it is essential to have an accurate picture of what species are present. By identifying species and adapting management practices to preserve biodiversity, future generations are provided a baseline of information to assess the success of those management practices. Previous studies have explored the mammal (Hackney and Stancampiano 2015) and bird (Jardine et al. 2016) diversity and habitat preferences. This study reports on the vascular plant diversity of the area.

## STUDY AREA

The JNSR is located in the southeastern corner of Canadian County, Oklahoma (35°21'00" N 97°40'17" W) (Figure 1). On the southern border, the South Canadian River flows east towards Cleveland County. The elevation in the area ranges from 356 m

to 418 m. The 150-hectare (371-acre) ranch has been maintained by the Last Frontier Council since 1932. The ranch is composed of various habitats such as upland and bottomland forests, mixed prairie, and disturbed areas. Based on satellite imagery, Hackney and Stancampiano (2015) estimated that approximately 70% of the site is wooded area while the other 30% is grassland, disturbed areas, and developed areas. Disturbed and developed areas can be found throughout JNSR in sections maintained for campsites, common areas used for boy scout activities, trails, and roadsides. Throughout the year, the level of human disturbance ranges from high to none. The most human influence occurs during the spring and summer months due to scouting camps. The area is irregularly mowed for maintenance, but mowing is restricted to inhabited areas such as campgrounds and surrounding establishments.

According to the United States Department of Agriculture Natural Resources Conservation Service (USDA-NRCS 2019b), the two main soil compositions are Darnell-Noble complex and Nash-Ironmound complex (Figure 2). The JNSR is in the Central Red-Bed Plains geomorphic province characterized by Permian red shales and sandstone that form gently rolling hills and broad, flat plains (Curtis et al. 2008). Located in the Central Great Plains Level III Ecoregion, the JNSR is on the border of the Prairie Tableland and Cross Timbers Transition Level IV Ecoregions (Woods et al. 2005). The dominant potential vegetation is a combination of tallgrass prairie and bottomland (floodplain) (Duck and Fletcher 1943).

In west-central Oklahoma from 1896–2018, the summer average temperature was 26.6 ± 13.4°C. Winter months averaged 3.17 ± 13.4°C. The highest temperatures occurred mostly in July with an average of 27.7°C, while the coldest temperatures occurred in January at an average of 2.00°C. Over the period, the average precipitation was 66.65 ± 34.70 cm. Precipitation reached an average low of 2.01 cm in January and an average high of 10.52 cm in May (Oklahoma Climatological Survey 2018).

## METHODS

The floristic survey occurred during the growing seasons (March to November) in 2017, 2018, and 2019. Vouchers of specimens were deposited in the Oklahoma City University (OCU) Herbarium following recommendation by Palmer and Richardson (2012) for published flora. Sources used for identification included Ryburn et al. (2018), Folley (2011), McCoy (1987), Tyrl et al. (2008), and Little (2010) along with comparison to specimens present in the OCU herbarium. Duration (annual, biennial, perennial) and growth form (forb, graminoid, shrub, tree, woody vine) were determined using the PLANTS Database (USDA-NRCS 2019a) and Taylor and Taylor (1994). Classification and nomenclature are based on Angiosperm Phylogeny Group (APG III) recommendations (Stevens 2019) and the Integrated Taxonomic Information System (ITIS 2019).

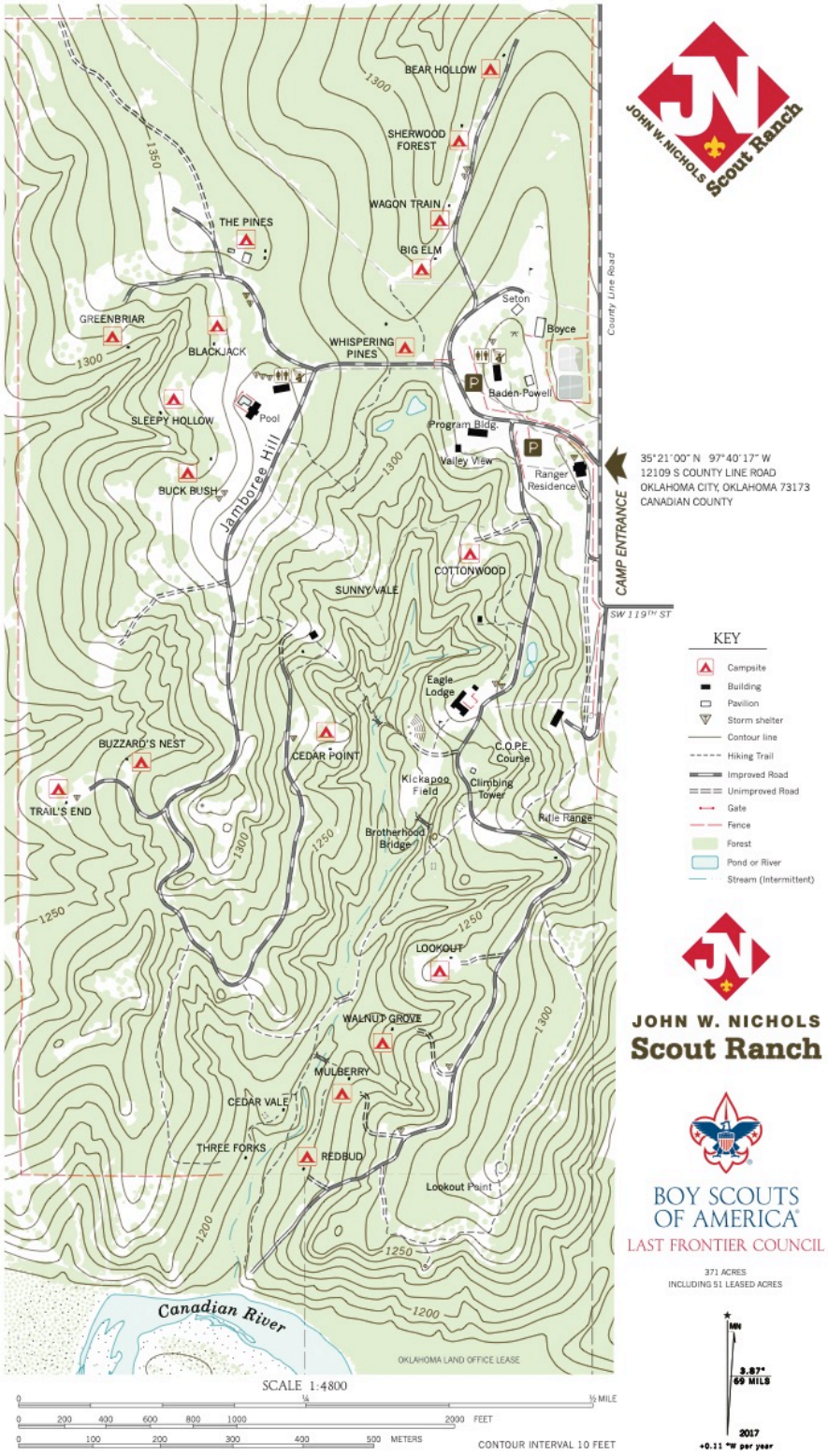


Figure 1 Map of JNSR, Canadian County, Oklahoma. Used by permission from the Last Frontier Council of the Boy Scouts of America.


Figure 2 Soil map of JNSR by USDA NRCS (2019b). NaD/NaD2 = Nash-Ironmound, W = water, DnF = Darnell-Noble, Gb = Gracemore, KfB = Kingfisher silt, MsC = Minco silt, Ya = Yahola

Table 1 Summary of floristic collections made from John Nichols Scout Ranch (JNSR)*

| Taxonomic Group | Families | Genera | Species | Native spp. | Exotic spp. |
|---|---|---|---|---|---|
| Monilophyta | 1 | 1 | 1 | 1 | 0 |
| Pinophyta | 2 | 3 | 3 | 1 | 2** |
| Magnoliophyta | | | | | |
| Eudicots | 38 | 89 | 121 | 107 | 14 |
| Monocots | 8 | 23 | 27 | 21 | 6 |
| Total | 49 | 116 | 152 | 130 | 22 |

*Table format follows Palmer et al. (1995)

***P. taeda* and *T. distichum* were planted in developed areas and were treated as exotic species in the inventory.

## RESULTS AND DISCUSSION

In total, 152 species in 116 genera and 49 families were collected at JNSR (Table 1; Appendix). Among the angiosperms, three families were predominant: Asteraceae (37 species), Poaceae (19), and Fabaceae (17). One fern species (*Asplenium platyneuron*) was collected. Three species of conifers were collected and included *Juniperus virginiana*, *Pinus taeda,* and *Taxodium distichum*. It should be noted, however, that *P. taeda* and *T. distichum* were planted in developed areas of the ranch and, while native to the state, were treated as exotic species in the inventory. The largest genera present were *Symphyotrichum* and *Oenothera* with four species each. Of the 152 species collected, 20 (13.16%) were considered exotic to the United States and six of these were considered invasive species by the Oklahoma Invasive Plant Council (2019). No rare species currently being tracked by the Oklahoma Natural Heritage Inventory (2019) were encountered.

The majority of JNSR is characterized by upland forest habitat that is dominated by *Quercus stellata* and *Quercus marilandica.* Other common species included *Celtis laevigata, Juniperus virginiana, Prunus mexicana, Sapindus saponaria, Smilax bona-nox,* and *Vitus vulpina.* Adjacent woodland margins that open into mixed prairie or disturbed areas were dominated by small tree and shrub species that included *Cercis canadensis, Cornus drummondii, Rhus glabra, Symphoricarpos orbiculatus,* and *Toxicodendron radicans*.

The second most abundant habitat is mixed prairie. Common mixed prairie species included *Achillea millefolium, Bouteloua curtipendula, Bouteloua gracilis, Bouteloua hirsuta, Dalea purpurea, Gaillardia pulchella, Liatris punctata, Oenothera speciosa, Opuntia humifusa, Rhus aromatica, Rhus glabra, Sabatia campestris, Schizachyrium scoparium, Sorghastrum nutans, Thelesperma filifolium,* and *Yucca glauca.*

The riparian zone along the South Canadian River that makes up the southern border of JNSR was dominated by herbaceous species, such as *Carex* spp.*, Cynodon dactylon, Phragmites australis, Sorghum halepense,* and *Typha latifolia,* and intermixed with woody species, such as *Salix exigua* and *Tamarix chinensis,* as the riparian zone gives way to bottomland forest habitat. Common bottomland forest species included *Carya illinoinensis, Catalpa bignonioides, Celtis laevigata,*

*Populus deltoides, Robinia pseudoacacia, Salix nigra,* and *Ulmus americana.*

Disturbed and developed areas can be found throughout JNSR in sections maintained for campsites, common areas used for boy scout activities, trails, and roadsides. Common species found in these disturbed areas included *Ambrosia psilostachya, Ambrosia trifida, Amphiachyris dracunculoides, Cynodon dactylon, Bothriochloa ischaemum, Helianthus annuus, Lespedeza cuneata, Lonicera japonica, Melilotus albus, Melilotus officinalis, Pinus taeda, Pistacia chinensis, Solanum elaeagnifolium, Sorghum halepense*, and *Taxodium distichum.*

Species richness is poor when compared to other similar sized (136–161 ha) floristic surveys (Palmer 2007). While this property provides a refuge for many species of flora and fauna, the encroaching agricultural areas and housing developments surrounding JNSR have contributed to lower plant diversity. Since urban sprawl of surrounding areas will likely continue to increase, a management plan must be established to maintain current, or improve upon, current levels of biodiversity.

## ACKNOWLEDGMENTS

We thank the Last Frontier Council of the Boy Scouts of America for the opportunity and permission to complete this survey. We also thank Laura E. Jardine and Emily Brown for assistance with plant collections and Sireene Khader for assistance with mounting specimens. Special thanks to Rhonda and David Crosswhite for support throughout the collection process.

## LITERATURE CITED

Curtis, N.M., W.E. Ham, and K.S. Johnson. 2008. Geomorphic provinces of Oklahoma. In: Johnson, K.S. and K.V. Luza, eds. *Earth Sciences and Mineral Resources of Oklahoma.* Educational Publication 9. Norman (OK): Oklahoma Geological Survey. http://www.ogs.ou.edu/pubsscanned/EP9_All.pdf

Duck, L.G. and J.D. Fletcher. 1943. A game type map of Oklahoma. In: *A Survey of the Game and Furbearing Animals of Oklahoma.* Oklahoma City (OK): Oklahoma Department of Wildlife Conservation. http://biosurvey.ou.edu/download/duckflt/dfmap.gif

Folley, P. 2011. *The Guide to Oklahoma Wildflowers.* Iowa City (IA): University of Iowa Press.

Hackney, S. and A.J. Stancampiano. 2015. Microhabitat preferences of a small mammal assemblage in Canadian County, Oklahoma. *Proceedings of the Oklahoma Academy of Science* 95:54–63.

Integrated Taxonomic Information System (ITIS). 2019. http://www.itis.gov (December 2019).

Jardine, L.E., A.N. Hosford, S.A. Legg, and A.J. Stancampiano. 2016. Habitat selection, nest box usage, and reproductive success of secondary cavity nesting birds in a semirural setting. *Proceedings of the Oklahoma Academy of Science* 96:101–108.

Last Frontier Council, Boy Scouts of America. 2019. John W. Nichols Scout Ranch. https://www.scoutingrocks.tv/JNSR

Little, E.L. Jr. 2010. *Forest Trees of Oklahoma: How to Know Them.* Rev. ed. No. 17. Oklahoma City (OK): Oklahoma Department of Agriculture, Forestry Services Division.

McCoy, D. 1987. *Oklahoma Wildflowers.* Oklahoma City (OK): Self-published.

Oklahoma Climatological Survey. 2018. The Climate of West Central Oklahoma. https://climate.ok.gov (15 December 2019).

Oklahoma Invasive Plant Council. 2019. Oklahoma Invasives. https://www.okinvasives.org (December 2019)

Oklahoma Natural Heritage Inventory. 2019. Oklahoma Natural Heritage Inventory Plant Tracking List. http://www.oknaturalheritage.ou.edu (December 2019)

Palmer, M.W. 2007. Vascular plants checklists from Oklahoma. *Oklahoma Native Plant Record* 7:67–77.

Palmer, M.W. and J.C. Richardson. 2012. Biodiversity data in the information age: Do 21st century floras make the grade? *Castanea* 77(1):46–59.

Palmer, M.W., G.L. Wade, and P.R. Neal. 1995. Standards for writing of floras. *Bioscience*. 45:339–345.

Ryburn, A.K., S.C. Barber, P. Buck, G.M. Caddell, W.J. Elisens, J.R. Estes, M. Fishbein, P. Folley, Lawrence K. Magrath, A.J. Moore, C.L. Murray, B.A. Smith, C.E.S. Taylor, R.A. Thompson, R.J. Tyrl, J.B. Walker, and L.E. Watson. 2018. *Flora of Oklahoma: Keys and Descriptions*. 2nd ed. Oklahoma City (OK): Flora Oklahoma Incorporated.

Stevens, P.F. 2001 onwards. Angiosperm Phylogeny Website. Version 14. http://www.mobot.org/MOBOT/Research/APweb/welcome.html (December 2019).

Taylor, R.J. and E.S. Taylor. 1994. *An Annotated List of the Ferns, Fern Allies, Gymnosperms and Flowering Plants of Oklahoma*. Durant (OK): Self-published.

Tyrl, R.J., T.G. Bidwell, R.E. Masters, and R.D. Elmore. 2008. *Field Guide to Oklahoma Plants: Commonly Encountered Prairie, Shrubland, and Forest Species*. 2nd ed. Stillwater (OK): Oklahoma State University.

USDA NRCS. 2019a. The PLANTS Database. http://plants.usda.gov (31 October 2019).

USDA NRCS. 2019b. Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx (October 2019).

Wilson, E.O. 1988. *Biodiversity*. Washington (DC): The National Academies Press.

Woods, A.J., J.M. Omernik, D.R. Butler, J.G. Ford, J.E. Henley, B.W. Hoagland, D.S. Arndt, and B.C. Moran. 2005. *Ecoregions of Oklahoma*. Reston (VA): U.S. Geological Survey. https://www.epa.gov/eco-research/ecoregion-download-files-state-region-6#pane-34 (December 2019).

## APPENDIX

### List of Plant Taxa at John W. Nichols Scout Ranch, Canadian County, Oklahoma

Annotated species list with organization based on Angiosperm Phylogeny Group (APG III) recommendations (Stevens 2019). Nomenclature is based on ITIS (2019), and common names are from the USDA PLANTS Database (USDA NRCS 2019a). Duration (A=annual, B=biennial, P=perennial), and growth form (F=forb, G=graminoid, S=shrub, T=tree, V=woody vine). Duration, nativity, and growth form are from the USDA PLANTS Database (USDA NRCS 2019a). If duration varied or if more than one growth form was listed in the PLANTS Database, the duration and growth form listed for Oklahoma by Taylor and Taylor (1994) was used. Non-native species to the United States are indicated with an asterisk (*).

**MONILOPHYTA**

**Aspleniaceae**
*Asplenium platyneuron* (L.) Britton, Sterns & Poggenb. (ebony spleenwort) – P; F

**PINOPHYTA**

**Cupressaceae**
*Juniperus virginiana* L. (eastern red cedar) – P; T
*Taxodium distichum* (L.) Rich. (baldcypress) – P; T

**Pinaceae**
*Pinus taeda* L. (loblolly pine) – P; T

**MAGNOLIOPHYTA**

**MONOCOTS**

**Amaryllidaceae**
*Nothoscordum bivalve* (L.) Britton (crowpoison) – P; F

**Asparagaceae**
*Yucca glauca* Nutt. (soapweed yucca) – P; F

**Commelinaceae**
*Tradescantia occidentalis* (Britton) Symth (prairie spiderwort) – P; F

**Cyperaceae**
*Carex* spp. L. (sedge) – G
*Eleocharis montevidensis* Kunth (sand spikerush) – P; G

**Iridaceae**
*Sisyrinchium campestre* E.P. Bicknell (prairie blue-eyed grass) – P; F

**Poaceae**
*Andropogon ternarius* Michx. (splitbeard bluestem) – P; G
**Bothriochloa ischaemum* (L.) Keng (yellow bluestem) – P; G; I
*Bothriochloa laguroides* (DC.) Herter (silver beardgrass) – P; G
*Bouteloua curtipendula* (Michx.) Torr. (sideoats gramma) – P; G
*Bouteloua gracilis* (Kunth) Lag. ex Griffiths (blue grama) – P; G
*Bouteloua hirsuta* Lag. (hairy grama) – P; G
**Bromus tectorum* L. (cheatgrass) – A; G; I
*Chasmanthium latifolium* (Michx.) H.O. Yates (Indian woodoats) – P; G
**Cynodon dactylon* (L.) Pers. (Bermudagrass) – P; G
*Dichanthelium oligosanthes* (Schult.) Gould (Heller's rosette grass) – P; G
*Dichanthelium scoparium* (Lam.) Gould (velvet panicum) – P; G
*Elymus canadensis* L. (Canada wildrye) – P; G
*Eragrostis secundiflora* J. Presl (red lovegrass) – P; G
*Paspalum floridanum* Michx. (Florida paspalum) – P; G
**Phragmites australis* (Cav.) Trin. ex Steud. (common reed) – P; G
**Poa annua* L. (annual bluegrass) – A; G
*Schizachyrium scoparium* (Michx.) Nash (little bluestem) – P; G
*Sorghastrum nutans* (L.) Nash (Indiangrass) – P; G
**Sorghum halepense* (L.) Pers. (Johnsongrass) – P; G; I

**Smilacaceae**
*Smilax bona-nox* L. (saw greenbrier) – P; V

**Typhaceae**
*Typha latifolia* L. (broadleaf cattail) – P; F

**EUDICOTS**

**Acanthaceae**
*Ruellia humilis* Nutt. (fringeleaf wild petunia) – P; F

**Anacardiaceae**
**Pistacia chinensis* Bunge (Chinese pistache) – P; T
*Rhus aromatica* Aiton (fragrant sumac) – P, S
*Rhus glabra* L. (smooth sumac) – P, S
*Toxicodendron radicans* (L.) Kuntze (eastern poison ivy) – P; S,V

**Apiaceae**
**Torilis arvensis* (Huds.) Link (spreading hedgeparsley) – A; F

**Apocynaceae**
*Asclepias asperula* (Decne.) Woodson (spider milkweed) – P; F
*Asclepias viridis* Walter (green antelopehorn) – P; F

**Asteraceae**
*Achillea millefolium* L. (common yarrow) – P; F

*Ambrosia psilostachya* DC. (Cuman ragweed) – P; F
*Ambrosia trifida* L. (giant ragweed) – A; F
*Amphiachyris dracunculoides* (DC.) Nutt. (prairie broomweed) – A; F
*Artemisia ludoviciana* Nutt. (white sagebrush) – P; F
*Cirsium altissimum* (L.) Hill (tall thistle) – B; F
*Cirsium ochrocentrum* A. Gray (yellowspine thistle) – P; F
*Cirsium texanum* Buckley (Texas thistle) – P; F
*Coreopsis tinctoria* Nutt. (golden tickseed) – A; F
*Echinacea angustifolia* DC. (blacksamson echinacea) – P; F
*Erigeron annuus* (L.) Pers. (eastern daisy fleabane) – A; F
*Erigeron strigosus* Muhl. ex. Willd. (prairie fleabane) – A; F
*Eupatorium serotinum* Michx. (lateflowering thoroughwort) – P; F
*Fleischmannia incarnata* (Walter) King & H. Rob. (pink thoroughwort) – P; F
*Gaillardia aestivalis* (Walter) H. Rock (lanceleaf blanketflower) – P; F
*Gaillardia pulchella* Foug. (Indian blanket) – A; F
*Gaillardia suavis* (A. Gray & Engelm.) Britton & Rusby (perfumeballs) – P; F
*Helianthus annuus* L. (annual sunflower) – A; F
*Heterotheca subaxillaris* (Lam.) Britton & Rusby (camphorweed) – A; F
*Hymenopappus filifolius* Hook. (fineleaf hymenopappus) – P; F
**Hypochaeris radicata* L. (hairy cat's ear) – P; F
*Liatris punctata* Hook. (dotted blazing start) – P; F
*Machaeranthera tanacetifolia* (Kunth) Nees (tanseyleaf tansyaster) – A; F
*Packera plattensis* (Nutt.) W.A. Weber & Á. Löve (prairie groundsel) – P; F
*Pyrrhopappus carolinianus* (Walter) DC. (Carolina desert-chicory) – A; F
*Pyrrhopappus grandiflorus* (Nutt.) Nutt. (tuberous deser-chicory) – P; F
*Ratibida columnifera* (Nutt.) Woot. & Standl. (upright prairie coneflower) – P; F
*Rudbeckia hirta* L. (blackeyed Susan) – P; F
*Solidago canadensis* L. (Canada goldenrod) – P; F
*Solidago speciosa* Nutt. (showy goldenrod) – P; F
*Symphyotrichum drummondii* (Lindl.) G.L. Nesom (Drummond's aster) – P; F
*Symphyotrichum lateriflorum* (L.) Á. Löve & D. Löve (calico aster) – P; F
*Symphyotrichum praealtum* (Poir.) G.L. Nesom (willowleaf aster) – P; F
*Symphyotrichum subulatum* (Michx.) G.L. Nesom (eastern annual saltmarsh aster) – A; F
*Thelesperma filifolium* (Hook.) A. Gray (stiff greenthread) – P; F
*Verbesina encelioides* (Cav.) Benth. & Hook. f. ex A. Gray (golden crownbeard) – P; F
*Vernonia baldwinii* Torr. (Baldwin's ironweed) – P; F

**Bignoniaceae**
*Campsis radicans* (L.) Seem. ex Bureau (trumpet creeper) – P; V
*Catalpa bignonioides* Walter (southern catalpa) – P; T

**Brassicaceae**
**Capsella bursa-pastoris* (L.) Medik. (shepherd's purse) – A; F
*Physaria ovalifolia* (Rydb.) O'Kane & Al-Shehbaz (roundleaf bladderpod) – P: F

**Cactaceae**
*Opuntia humifusa* (Raf.) Raf. (devil's tongue) – P; S

**Caprifoliaceae**
*****_Lonicera japonica_ Thunb. (Japanese honeysuckle) – P; V; I
_Symphoricarpos orbiculatus_ Moench (coralberry) – P; S

**Caryophyllaceae**
_Paronychia jamesii_ Torr. & A. Gray (James' nailwort) – P; F

**Cornaceae**
_Cornus drummondii_ C.A. Mey. (Roughleaf dogwood) – P; S

**Euphorbiaceae**
_Acalypha gracilens_ A. Gray (slender threeseed mercury) – A; F
_Croton capitatus_ Michx. (hogwort) – A; F

**Fabaceae**
_Cercis canadensis_ L. (eastern redbud) – P; T
_Dalea aurea_ Nutt. ex Fraser (golden prairie clover) – P; F
_Dalea candida_ Michx. ex Willd. (white prairie clover) – P; F
_Dalea enneandra_ Nutt. ex Fraser (nineanther prairie clover) – P; F
_Dalea purpurea_ Vent. (purple prairie clover) – P; F
_Desmodium obtusum_ (Muhl. ex Willd.) DC. (stiff ticktrefoil) – P; F
_Gleditsia triacanthos_ L. (honeylocust) – P; T
*****_Lespedeza cuneata_ (Dum. Cours.) G. Don (sericea lespedeza) – P; F; I
_Lespedeza stuevei_ Nutt. (tall lespedeza) – P; F
*****_Medicago lupulina_ L. (black medick) – A; F
*****_Medicago sativa_ L. (alfalfa) – P; F
*****_Melilotus albus_ Medik. (white sweet clover) – A; F
*****_Melilotus officinalis_ (L.) Lam. (yellow sweet clover) – A; F
_Mimosa quadrivalvis_ L. (fourvalve mimosa) – P; V
_Psoralidium tenuiflorum_ (Pursh) Rydb. (slimflower scurf pea) – P; F
_Robinia pseudoacacia_ L. (black locust) – P; T
_Vicia sativa_ L. (garden vetch) – A; F

**Fagaceae**
_Quercus marilandica_ Munchh. (blackjack oak) – P; T
_Quercus shumardii_ Buckley (Shumard's oak) – P; T
_Quercus stellata_ Wangenh. (post oak) – P; T

**Gentianaceae**
_Sabatia campestris_ Nutt. (Texas star) – A; F

**Geraniaceae**
*****_Erodium cicutarium_ (L.) L'Hér. ex Aiton (redstem stork's bill) – A; F

**Hypericaceae**
_Hypericum drummondii_ (Grev. & Hook.) Torr. & A. Gray (nits and lice) – A: F

**Juglandaceae**
*Carya illinoinensis* (Wangenh.) K. Koch (pecan) – P; T

**Lamiaceae**
*Clinopodium glabrum* (Nutt.) Kuntze (limestone calamint) – P; F
*Monarda fistulosa* L. (wild bergamot) – P; F
*Scutellaria incana* Biehler (hoary skullcap) – P; F
*Scutellaria parvula* Michx. (small skullcap) – P; F
*Stachys pilosa* Nutt. (hairy hedgenettle) – P; F
*Teucrium canadense* L. (Canada germander) – P; F

**Malvaceae**
*Callirhoe involucrata* (Torr. & A.Gray) A. Gray (purple poppymallow) – P; F

**Moraceae**
**Morus alba* L. (white mulberry) – P; T

**Oleaceae**
*Fraxinus americana* L. (white ash) – P; T

**Onagraceae**
*Oenothera berlandieri* (Spach) Steud. (Berlandier's sundrops) – P; F
*Oenothera serrulata* Nutt. (yellow sundrops) – P; F
*Oenothera speciosa* Nutt. (pinkladies) – P; F
*Oenothera suffulta* (Engelm.) W.L. Wagner & Hoch (kisses) – A; F

**Orobanchaceae**
*Castilleja indivisa* Engelm. (entireleaf Indian paintbrush) – A; F

**Papaveraceae**
*Argemone polyanthemos* (Fedde) G.B. Ownbey (crested pricklypoppy) – A; F

**Plantaginaceae**
*Nuttallanthus canadensis* (L.) D.A. Sutton (Canada toadflax) – A; F
**Plantago lanceolata* L. (narrowleaf plantain) – P; F
*Plantago virginica* L. (Virginia plantain) – A; F

**Polygonaceae**
*Eriogonum annuum* Nutt. (annual buckwheat) – A; F

**Rosaceae**
*Crataegus viridis* L. (green hawthorn) – P; T
*Geum canadense* Jacq. (white avens) – P; F
*Prunus angustifolia* Marshall (Chickasaw plum) – P; S
*Prunus gracilis* Engelm. & A. Gray (Oklahoma plum) – P; S
*Prunus mexicana* S. Watson (Mexican plum) – P; T

**Rubiaceae**
*Houstonia pusilla* Schoepf (tiny bluet) – A; F
*Stenaria nigricans* (Lam.) Terrell (diamond-flowers) – P; F

**Salicaceae**
*Populus deltoides* W. Bartram ex Marshall (eastern cottonwood) – P; T
*Salix exigua* Nutt. (narrowleaf willow) – P; S
*Salix nigra* Marshall (black willow) – P; T

**Santalaceae**
*Phoradendron serotinum* (Raf.) M.C. Johnst. (oak mistletoe) – P; S

**Sapindaceae**
*Sapindus saponaria* L. (western soapberry) – P; T

**Solanaceae**
*Solanum carolinense* L. (Carolina horsenettle) – P; F
*Solanum dimidiatum* Raf. (western horsenettle) – P; F
*Solanum elaeagnifolium* Cav. (silverleaf nightshade) – P; F

**Tamaricaceae**
* *Tamarix chinensis* Lour. (five-stamen tamarisk) – P; S,T; I

**Ulmaceae**
*Celtis laevigata* Willd. (sugarberry) – P; T
*Ulmus americana* L. (American elm) – P; T

**Valerianaceae**
*Valerianella radiata* (L.) Dufr. (beaked cornsalad) – A; F

**Verbenaceae**
*Glandularia canadensis* (L.) Nutt. (rose mock vervain) – P; F
*Glandularia pumila* (Rydb.) Umber (pink mock vervain) – A; F

**Vitaceae**
*Vitis vulpina* L. (frost grape) – P; V