FINAL PERFORMANCE REPORT

Federal Aid Grant No. F13AF01165 (T-67-1)

Oklahoma Ecological Systems Mapping: Phase 2, Western Oklahoma

Oklahoma Department of Wildlife Conservation

October 1, 2013 through September 30, 2015

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State: Oklahoma   **Grant Number:** F13af01165
(T-67-1)

Grant Program: State Wildlife Grant

Grant Title: Oklahoma Ecological Systems Mapping: Phase 2, Western Oklahoma

Grant Period: October 1, 2013 – September 30, 2015

**Reporting Period:** October 1, 2013 – September 30, 2015

Objective
To create a spatial database and a 10-meter resolution vegetative cover map for 25 counties in western Oklahoma.

Summary
This project has been completed and we have produced a map of high spatial resolution (10 m) depicting the existing vegetation and landcover using modifications of the ecological systems classification of NatureServe as the legend. This product includes vegetation mapping for the counties west of, and including, Blaine, Cotton, Custer, Garfield, Kay, Kingfisher, Kiowa, Tillman, and Washita. Accomplishments include: 1) development of thematically coarse land cover at 30 m resolution based on Landsat imagery and abiotic variables; 2) review and application of over 1200 field-collected data points for developing the land cover classification and vegetation models; 3) production of image objects (vector data) from NAIP imagery; 4) application of land cover (from 1 above), abiotic, and other ancillary data to image objects, including digital elevation model derived variables, modified SSURGO soils data, riparian buffers, and roads data; 5) application of models linking land cover and abiotic data to produce a draft vegetation/land cover map for the project area; 6) field review of draft product; 7) Final draft of the current vegetation map in Western Oklahoma; 8) An Interpretive booklet describing the totality of the project; 9) Produce a merged dataset with the Eastern portion of the state that was done outside the scope of this project.

Land Cover
Using three dates of Landsat imagery and abiotic data derived from digital elevation models at 30 m resolution, we developed a classification of land cover with coarse thematic resolution (15 classes). Multiple iterations resulting from review of the products were accomplished culminating in the best possible land cover data layer. These revisions continued until just prior to field reconnaissance of the draft product, and additional information gathered during the first year field trip was applied to additional iterations of the classification and continued improvement in the land cover. A trip occurred in the spring of 2015 to further investigate problematic areas and provide base reference data to map them. After the initial draft was completed and issues identified, modeling work on the landcover occurred to address the issues and resolve them.
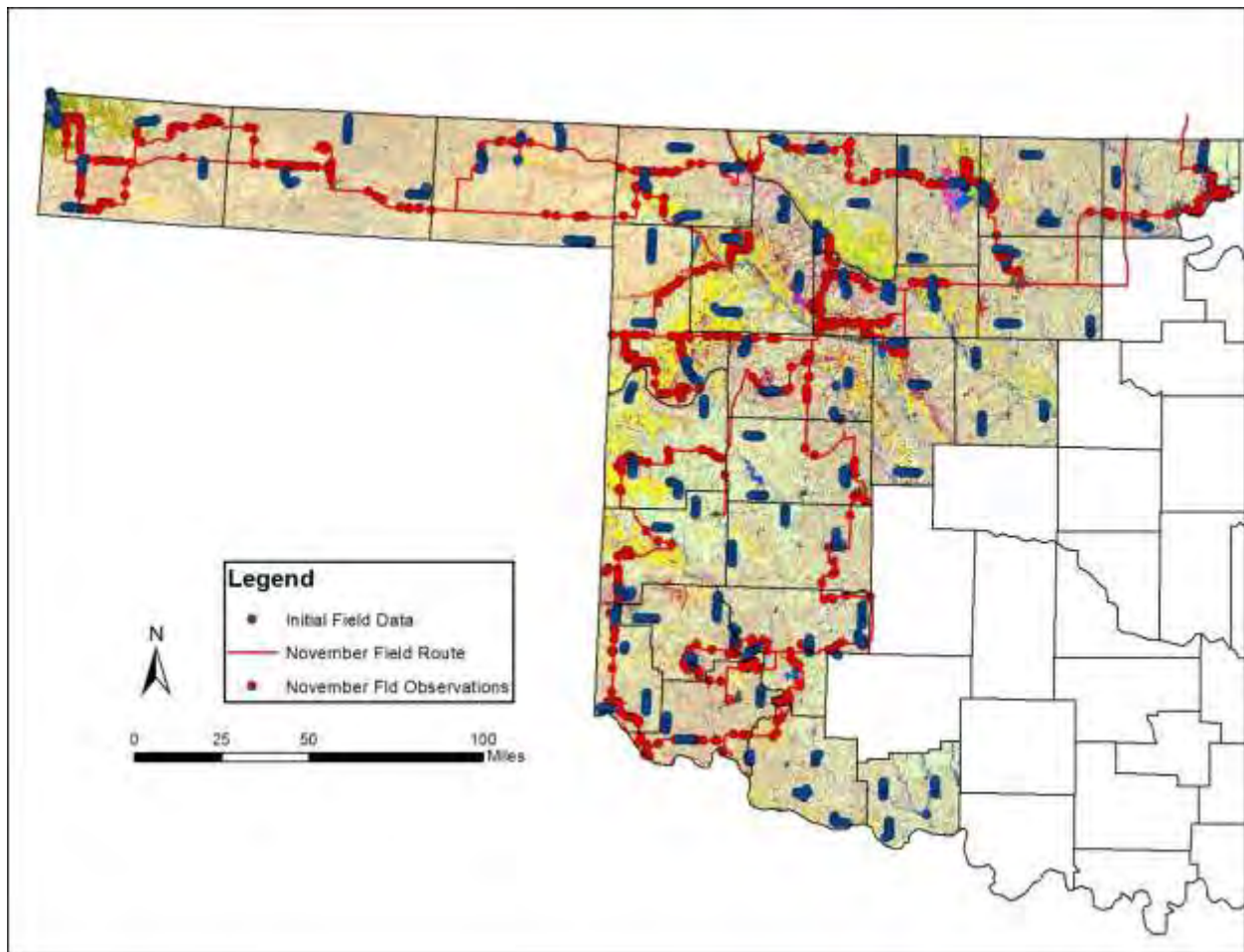
Figure 1. Initial draft of vegetation map for Phase 2. This draft product was used during a November field assessment. The route and field observations are shown in red (lines and points) and initial field points are shown in blue (points). Eighty-one mapped types are depicted.

Review of Additional Ancillary Data

Two additional data sets were reviewed for inputs to improve the final product. The first product, "Remote sensing of conifer and mesquite encroachment into lesser prairie-chicken habitats," was developed by the Michigan Technological University and was carefully reviewed to determine if the product could provide additional inputs to enhance the delineation of eastern redcedar concentrations. The second product, from LANDFIRE, was the existing vegetation cover layer (EVC), version 1.3. This product was carefully reviewed to see if it might improve the delineation of shrub cover within the project area. Other datasets (Probable Playas, NWI, etc.) were reviewed to map water features and help identify wetlands.

Field Review of Draft

We accomplished a 5-day long field trip to Oklahoma to review an early draft of the vegetation map that was produced just prior to the initiation of the trip. We made over 700 georeferenced observations designed to improve the map. We traveled over 2,000 miles within Phase 2 of the

mapping project. Two ODWC staff (Mark Howery and Kyle Johnson) joined us during parts of the trip, and we were able to demonstrate the draft product to them. During this trip we were able to review contributing data such as land cover, soils data, ecoregion delineation, and model rules to ensure production of a useful final product. The Final Draft was reviewed during the Summer of 2015.

Availability
This dataset and interpretive booklet (see attached) is available on ODWC's webpage.
www.wildlifedepartment.com/facts_maps/ecoregions.htm

Future Plans
We plan to disseminate this information to partners and hold meetings and outreach events as we can.

Updates to Timeline and Expected End Date:
Project ended on time and at budget as of September 30, 2015.

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Date: 11 December 2015

Approved by:

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Oklahoma Department of Wildlife Conservation

Wildlife Division Administration
Oklahoma Department of Wildlife Conservation

Oklahoma Vegetation Classification Project: Interpretive Booklet

Oklahoma Department of Wildlife Conservation

From top: Wichita Mountains vegetation complex, sandhill shinnery, and montane stunted oak woodland

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Executive Summary

State wildlife biologists and other natural resource professionals have recognized the need for accurate current vegetation maps to facilitate conservation planning and management for decades. The Oklahoma Geographic Information Council has pursued avenues to up-date and improve statewide current vegetation maps for at least the five years before this project began. Meanwhile, in Texas, a group led by the Texas Parks and Wildlife Department launched an effort to develop fine spatial and thematic resolution current vegetation maps for Texas, the Texas Ecological Systems Mapping Project, in the summer of 2007 (Elliott et al. 2014). Results of this effort were reviewed by personnel within the Oklahoma Department of Wildlife Conservation (ODWC) in the spring of 2011. Likewise, personnel within the Gulf Coast Prairie and Great Plains Landscape Conservation Cooperatives (LCCs) were aware of results coming from the Texas project. The LCCs required seamless current vegetation data across state lines. Thus, the Oklahoma Ecological Systems classification and mapping project was launched in 2012 with initial funding from the ODWC and LCCs, and was finished by the summer of 2015. Funding to collect ground data and assist with classification and mapping was provided to the Oklahoma Biological Survey, University of Oklahoma. Funding to complete remote sensing, mapping, and interpretive information was provided to the Missouri Resource Assessment Partnership (MoRAP), University of Missouri. MoRAP was also the primary partner involved in the Texas Ecological Systems mapping project, and used expertise developed during that project to apply toward the Oklahoma project. Key state cooperators (e.g. representatives within the Oklahoma Geographic Information Council) were brought into the process early on via presentations both at a general meeting and at a land cover technical committee meeting. Groups represented within the Council will be among the primary end users, stewards, and modifiers of the current vegetation data under development.

The Ecological Systems Classification for the US, accessible via the NatureServe Explorer website, served as the basis for classification and mapping. This classification has been modified for Oklahoma and a 69-page document was delivered under separate cover to the Oklahoma Department of Wildlife Conservation. The basic classification and mapping methods incorporated remote sensing for land cover (about 15 classes), and overlay of digital soils, %slope, and streams to create the map. A total of 3,709 georeferenced, quantitative data points were gathered in a systematic way, and 1,114 more georeferenced points were gathered to help improve the map. A total of 165 vegetation types were mapped. Summary statistics from points show that three of the most frequent six species in the herbaceous layer were non-native species. Post oak was by far the most common tree encountered. The primary grassland types of Oklahoma together accounted for more than a third of the area of the state, and cropland made up more than 15% of the area. More than half of the mapped types occupy fewer than 10,000 hectares of the state.

Acknowledgements

Suggested Citation for This Document:
Diamond, D.D. and L.F. Elliott. 2015. Oklahoma ecological systems mapping interpretive booklet: Methods, short type descriptions, and summary results. Oklahoma Department of Wildlife Conservation, Norman.

This document draws on information developed for the Texas Ecological Systems Classification project (Elliott et al. 2014).

Product Specifications and Work Flow

Funding was initially sufficient to map only central and eastern Oklahoma, so the project will be completed in two phases (Figure 1). The entire project will be completed by the winter of 2015.
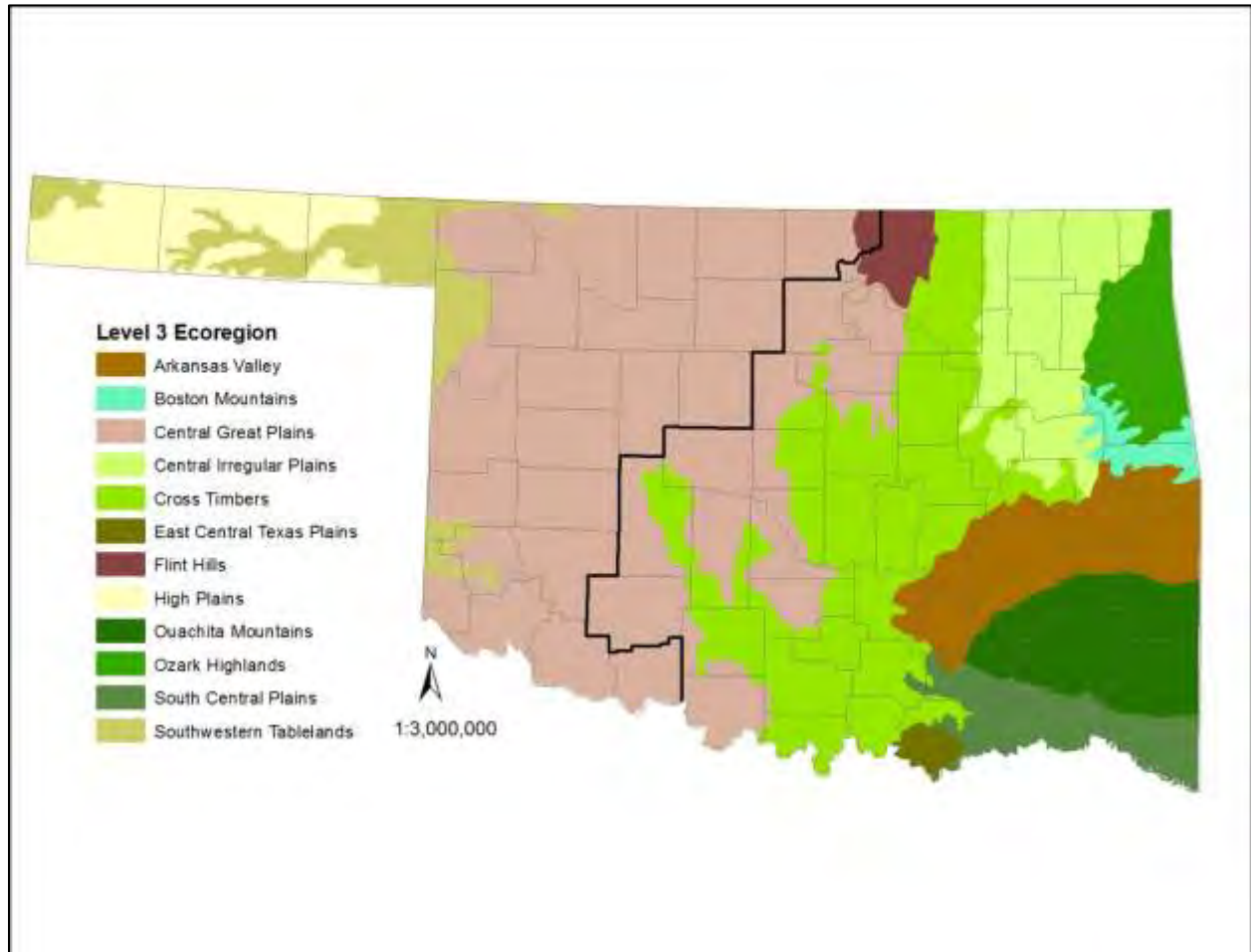
Figure 1. The Ecological Systems mapping project was completed in two phases. Phase 1 occupies the eastern portions of the state (east of the dark black line) and Phase 2 occupies the western portions.

Bruner (1931) provided the first modern description and maps of the vegetation of Oklahoma, and Duck and Fletcher (1943) provided a classic map of the current vegetation of Oklahoma at coarse resolution. Hoagland (2000) provided a recent classification, which served, in part, as the basis for the current National Vegetation Classification and the Ecological Systems Classification for the USA (see NatureServe Explorer at http://explorer.natureserve.org/servlet/NatureServe?init=Ecol). Together these products were used to generate the Ecological System and Mapping Subsystems mapping targets for the current project. Mapping Subsystems are generally land cover

variants of Ecological Systems, such as pine versus oak within pine-oak Ecological Systems.

The National Landcover Dataset (NLCD) (http://landcover.usgs.gov/uslandcover.php), the USGS GAP Analysis dataset (http://gapanalysis.nbii.gov/portal/server.pt), and the national LandFire map (http://www.landfire.gov) data set are all done at 30 m spatial resolution. While useful, none of these maps seemed adequate to facilitate management and conservation efforts at fine enough spatial and thematic (number of mapped types) resolution for Oklahoma. Therefore, the following criteria were set forward for the Ecological Systems map:

Conform to the National Ecological Systems Classification framework
Collect quantitative, georectified ground data (>3000 points) in support of the mapping
Spatial resolution at 10 m
Thematic resolution at >175 mapped types, including ruderal or invasive types
Polygon-based, to facilitate easy modifications
Summarized and interpreted for natural resource managers

Aspects of the work flow included coordination between OU, ODWC, and MoRAP, and coordination among MoRAP staff members with diverse skill sets. A fairly complex and time –intensive set of tasks was performed. In broad outline, these steps included (Figure 2):

1. Identification of mapping targets. This step took the shape of a two-day meeting with staff from ODWC, OU, and MoRAP. Draft mapping targets were developed from the Ecological Systems classification for the USA, and naming conventions were adopted and modified from the Texas mapping effort.
2. Collection of field data. A standardized, quantitative, spatially specific methodology was used to collect >3,000 field observations.
3. Remote sensing classification of land use/landcover. Three date mosaics of Thematic Mapper Satellite Imagery were used to perform a supervised classification (see methods, below).
4. Development of abiotic information. Soil groups from county digital soil surveys formed the backbone of this effort, and the development of these from information supplied by the National Resources Conservation Service (NRCS) was an iterative process. Soil groups were created initially from the ecological site types, viewed, and revised, sometimes by hand, as needed. Digital elevation model (DEM)-derived variables were also used. Percent slope was the only DEM-derived variable used, though other geomorphic parameters were included

in the classification (step 3). Stream buffers and ecoregions were also considered abiotic variables for modeling (see step #7).

5. Development of image objects (segmentation) from air photos at 10 m resolution. Input data for object creation was from a single variable generated from 3-band air photos (see methods, below).

6. Attribution of image objects with land use/landcover (from step #3) and abiotic variables (from step #4). The attribution of small image objects with information from several separate data sources, each with their own spatial resolution and source, was an involved process that required tiling and systematic application of rules for dealing with issues.

7. Development and application of an Ecological Systems and Subsystems (current vegetation) classification and mapping models based on the attributes assigned to image objects in step #6. This was an iterative process that required on-screen viewing and revision of results. The end result of this step was a draft ecological systems map.

8. Rapid field survey and collection of strategic, georectified data points related to issues discovered in the draft map, and revision of the map.

9. Development of final map and database. This step involved use of ancillary data, such as roads, to improve the look of the map.

10. Development of interpretive materials and final geodatabase. This involved modification and additions to technical descriptions of ecological systems and mapping subsystems that corresponded with mapped types, plus development of new, short descriptions of mapped types. This step also resulted in summaries and caveats for users.
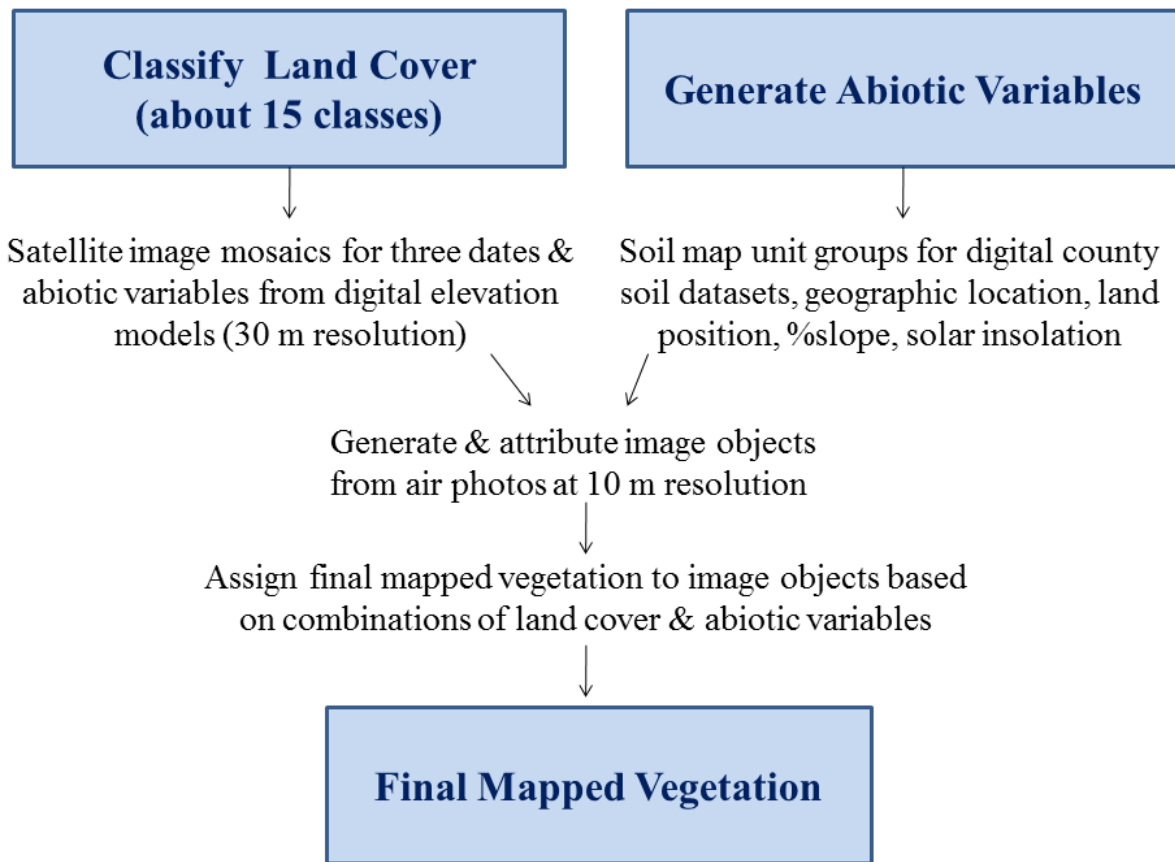
Figure 2. General methods for production of Ecological Systems map.

Methods

Collection of Field Data

OU and partner personnel collected ground data on landcover, composition, and ecological system using a legend initially developed via expert committee. The starting point for the legend was NatureServe's Ecological Systems classification, but this was supplemented with an eye toward mapping all landcover types within each Ecological System (Ecological Mapping Subsystem) if those cover types existed. In addition, agricultural and other human-related types were included in the legend. The general data collection procedure included:

1. Sample plots were located either near a road or on accessible private or public lands. Locations were precise, based on use of a GPS and GIS software on a computer in the field vehicle. Samples sites were selected based on road or property access and variation in image signature or mapped soil types (i.e.; high diversity in landcover and mapped soils types was desirable).
2. Samples along roads were collected at approximately one-mile intervals, often on both sides of the same road, starting from a random location. In addition, samples were collected at many stream/road crossings, and where uncommon plant communities were noted.
3. For data collected along roads, we were limited to views from the right-of-way, air photography, and other environmental data layers loaded on the laptop, including county SSURGO soils. Where trees obscured the view away from the road, we relied primarily on aerial photos and road-side observation to select a sample plot of relatively homogeneous vegetation. All sample plots were located at least 60 meters from the road within the center of a square with sides of at least 50 meters, to help ensure that the footprint of a corresponding 30 m satellite pixel fell within a homogeneous land cover patch.

We collected a standardized suite of data using a computerized feature data form with drop-down windows to reduce mistakes, and we took a picture at most site locations (Table 1). Drop-down lists used plant names from the USDA Plants database. Initial species lists for Phase 1 were developed by referring to information already prepared for areas in Texas adjacent to Oklahoma.

Table 1. Example of information within the feature database used for field data collection.

Field Name	Data Type	Example Value(s)	Description
SampleDate	Date	9/21/2012	Date sample taken.
TeamLeader	Text	Kayti Ewing	Name of data collection team leader.
SiteID	Integer	291	Unique identifier for sample site.
PictureID	Integer	421	Unique identifier for each sample site photo.
EcoSysName	Text	Crosstimbers: Post Oak Woodland	Name of Ecological System from the map legend
EcoSysConf	Text	High	A categorical value expressing team leader's confidence in correctness of Ecological System identification. Values: High, Good, Medium, Low.
LandCover	Text	Forest	Name of the landcover class (see Table 2)
Woody_PC	Text	76-100	Total percent cover of all woody vegetation - categorical data 0-5, 6-25, 26-50, 51-75, 76-100
NLEG_PC	Text	76-100	Total percent cover of all needle-leafed evergreen trees - categorical data 0-5, 6-25, 26-50, 51-75, 76-100 -- must be less than or equal to Woody_PC
Tree_PC	Text	76-100	Total percent cover of all trees - categorical data 0-5, 6-25, 26-50, 51-75, 76-100 -- must be less than or equal to Woody_PC
Shrub_PC	Text	26-Jun	Total percent cover of all shrubs - categorical data 0-5, 6-25, 26-50, 51-75, 76-100 -- must be less than or equal to Woody_PC
Herb_PC	Text	0-5	Total percent cover of all herbaceous plants - categorical data 0-5, 6-25, 26-50, 51-75, 76-100
Tree1	Text	*Quercus stellata*	Scientific name of **most** visually dominant over-story tree species in plot area. This is a single-trunked perennial woody plant of greater than 5 meters in height. NA if none present.
Tree2	Text	*Quercus marilandica*	Scientific name of **second most** visually dominant over-story tree species in plot area. This is a single-trunked perennial woody plant of greater than 5 meters in height. NA if none present.
Tree3	Text	*Carya texana*	Scientific name of **third most** visually dominant over-story tree species in plot area. This is a single-trunked perennial woody plant of greater than 5 meters in height. NA if none present.
Shrub1	Text	*Ulmus alata*	Scientific name of **most** visually dominant shrub in plot area. Shrub is defined as woody perennial plant, usually multi-trunk, between .5 meters and 5 meters in height. Will contain NA value if no shrubs present in plot.
Shrub2	Text	*Cercis canadensis*	Scientific name of **second most** visually dominant shrub in plot area. Shrub is defined as woody perennial plant, usually multi-trunk, between .5 meters and 5 meters in height. Will contain NA value if no shrubs present in plot.
Shrub3	Text	*Ulmus rubra*	Scientific name of **third most** visually dominant shrub in plot area. Shrub is defined as woody perennial plant, usually multi-trunk, between .5 meters and 5 meters in height. Will contain NA value if no shrubs present in plot.
Herb1	Text	*Cynodon dactylon*	Scientific name of **most** visually dominant herbaceous plant in plot area (1/4 acre). Include woody vines. Will contain bare ground if no herbaceous plants are present.
Herb2	Text	*Schizachyrium scoparium*	Scientific name of **second most** visually dominant herbaceous plant in plot area (1/4 acre). Include woody vines. Will contain NA if bare or only one species present.
Herb3	Text	*Elymus canadensis*	Scientific name of **third most** visually dominant herbaceous plant in plot area (1/4 acre). Include woody vines. Will contain NA if bare or only one species present.
Notes	Text	Pasture, Garber Sandstone outcropping present	Any additional information that might aid in the interpretation of the vegetation at the point.

Remote Sensing Classification

We used three dates of Landsat Thematic Mapper satellite data, combined with other information, to classify the landcover. After data acquisition, the next step in the classification process was to create a seamless mosaic of LandSat scenes for all dates.

The generation of the mosaics was neither a straightforward nor a simple task. The imagery used to build the mosaics needed to be, for the most part, cloud-free. This condition rarely exists in practice. Because of clouds, often a given path-row of imagery was itself a mosaic. Maintaining a consistent date throughout each seasonal mosaic brought additional complexity to the process. The most challenging step in generating the seasonal mosaics was the issue of color balancing. This process removes the apparent divisions among adjacent path-rows of imagery by matching, on a band by band basis, the histograms of all the images used. This process is iterative in nature and is often one of the most labor intensive portions of the landcover mapping protocol.

We used a decision tree classification approach to classify the initial 14 landcover classes for Phase 1 (Table 2). In Phase 2, Pine Plantation was removed as a possible target for the classification, but Shinnery Oak was added, resulting in 14 landcover classes for Phase 2 as well. This approach allows for the combination of remotely sensed data with ancillary data in a flexible way. We tried multiple different combinations of satellite reflectance data and ancillary data before settling on a final combination that provided the best result. Important ancillary data used for classification (in addition to all 6 LandSat reflectance bands for three dates), included slope, aspect, landscape position, solar insolation, percent canopy cover from the National Landcover Dataset (NLCD), percent impervious surface from the NLCD, change detection from the NLCD, and agricultural areas as defined by the most recent version of the National Agricultural Statistics Service cropland data layer.

Table 2. Fourteen land cover classes from three season mosaics of 30 m resolution satellite remote sensing data.

Landcover Class	Description	Examples from Phase 1
Barren/Sparsely Vegetated	little or no vegetation year-round	river beds, quarries, areas cleared for development
Cold Deciduous Forest and Woodland	>25% total tree canopy (>4 m tall), where >75% of the relative cover is cold deciduous trees	oaks, hackberry, elm, ash
Cold Deciduous Shrubland	>25% total canopy of trees and shrubs (<4 m tall), where the majority of the canopy is shrubs, and the majority of the woody plants are cold deciduous	sumacs, winged elm, mesquite, Chickasaw plum
Coniferous Evergreen Forest and Woodland	>25% total tree canopy (>4 m tall), where >75% of the relative cover is coniferous evergreen	pines, eastern redcedar
Coniferous Evergreen Shrubland	>25% total canopy of trees and shrubs (<4 m tall), where the majority of the canopy is shrubs, and the majority of the woody species are evergreen	eastern redcedar, Ashe juniper
Grassland	dominated by herbaceous vegetation, usually graminoid, with less than 25% woody cover. Includes both planted pasture and native prairie.	Bermudagrass, little bluestem, field brome
Herbaceous Emergent	seasonally or semi-permanently flooded, or saturated soil wetlands dominated by herbaceous vegetation	rushes, sedges, grasses
High Intensity Urban	urban development, generally >70% impervious cover	city centers, highways
Low Intensity Urban	urban development, generally <70% impervious cover	residential areas
Mixed Cold Deciduous / Evergreen Forest and Woodland	>25% total tree canopy (>4 m tall), where >75% of the relative cover is neither only cold deciduous trees or only evergreen trees	oaks with eastern redcedar or pines
Open Water	open water with little or no emergent vegetation	reservoirs, ponds, rivers
Pine Planation	pine plantation based on evidence of clear cuts between 2000 and 2012 or dense, regular signature	loblolly pine plantations that are intensively managed
Row Crops	Row crop agricultural lands	sorghum, corn
Seasonally Flooded Bottomland	areas with evidence of water at the surface during at least one season	limited to river floodplains of southeast Oklahoma

The decision tree classification approach requires a training data set for each landcover class mapped, and we used both field-collected and photo interpreted information. Air photo interpretation used leaf-on photos. Most photo-interpreted training points were generated via (1) generating a random grid of sample sites across the area, (2) zooming to those locations at 1:6,000 resolution, and (3) circumscribing visually homogeneous vegetation and assigning those points a landcover type. We checked all ground-collected data using air photos and eliminated data points that appeared to fall within mixed landcover based on expert judgment. In most cases, point data were double-checked by a second worker using leaf-on photography to ensure that the correct landcover type had been assigned to each point.

The decision tree classification process assigns pixels to landcover classes using the statistical relationship between the training data and the satellite imagery and ancillary data of a given area. All decision tree classifications were run using a 30 m spatial resolution, which is the native spatial resolution for the Landsat Thematic Mapper imagery. The classification procedure was implemented multiple times, using different combinations of data, in an effort to maximize classification accuracy. Additional points were often required when areas of a known landcover type were consistently missed by the decision tree process. In those cases, staff inspected the high resolution aerial photography and identified additional sample points of the necessary landcover type. This process took advantage of staff ecological expertise and their experience identifying the landcover types of Oklahoma. We generated more than 20 different classification results.

Ecological System (Current Vegetation) Classification and Mapping: Image Object Generation, Attribution, and Modeling

Image Object Generation and Attribution with Landcover. A one hectare minimum mapping unit (MMU) was specified for this project. To ensure that the MMU was achieved, a post hoc process was implemented using image objects generated with the eCognition Developer software (Figure 3). Image objects were generated from the first principle component of a NAIP image county mosaic that had been re-sampled to a 10 m spatial resolution. This procedure was run for each county mosaic. Some counties needed to be divided into multiple pieces because they were too large to be processed individually. This process produced a shapefile containing polygons that represented homogeneous units (relative to the 10 m PCA result for each county mosaic). The image objects were then used to summarize the classification resulting from the decision tree classification procedure. The statistic of interest during the summarization process was the mode. ArcGIS was used to determine the mode for each object. The separate sets of image objects were then imported to a file geodatabase.

30 Meter Land Cover   10 Meter Land Cover
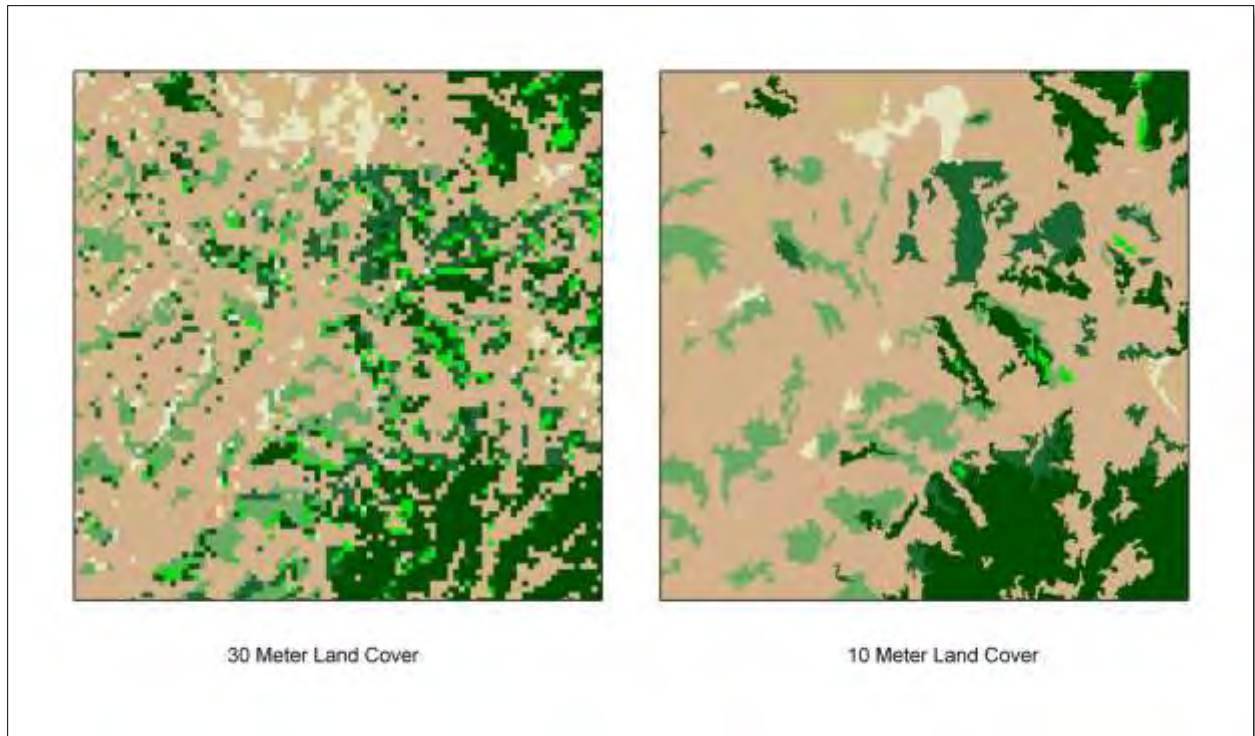
Figure 3.Illustration of the increase in spatial resolution from 30 meter pixels to 10 meter pixels. Image objects were generated from the first principle component of a NAIP image county mosaic that had been re-sampled to 10 meters.

Image Object Attribution with Abiotic Variables. Abiotic environmental data were generated and attributed to image objects, in addition to land cover data (Figure 4). In summary, we attributed the following information to objects:

1. Soil group from digital county soil map units provided by the Natural Resource Conservation Service (NRCS) Soil Geographic Database (SSURGO). We formed soil map unit groups by reference to ecological site type (ecoclassid in the SSURGO data tables; see http://soils.usda.gov/survey/geography/ssurgo/), by soil texture, and by flooding frequency. Mixed soil map units (map unit polygons with more than one soil component type) generally made up less than 10% of all soil polygons, and were assigned to groups based on the majority component for a given map unit. Sometimes, individual soil map units were assigned to groups based on selections done by hand, on-screen, or via geographic rules or other ancillary data. We assigned a unique ID to each soil map unit polygon to track all of the changes that we made to the soil map units based on ancillary data.
2. A riparian designation was based on stream center lines taken from the 1:24,000 National Hydrologic Dataset (see http://nhd.usgs.gov/data.html). These riparian

corridors were 30 m wide and were applied to portions of polygons derived from image objects.

3. A %slope designation generated from 10 m digital elevation models (DEMs; see USGS National Elevation Dataset, http://ned.usgs.gov/). In most regions, land cover on slopes greater than 20% were assigned to slope Ecological Mapping Systems or Mapping Subsystems, separate from flatter areas.

In addition, transportation corridors were 'burned in' to the final map by reference to center lines from US Census TIGER data (see http://www.census.gov/geo/maps-data/data/tiger.html).

Land Cover

Digital County Soils

Slopes >20% in yellow
Cliffs (slopes>100%) in red

Floodplains & Riparian Zones

Final Mapped Vegetation Types
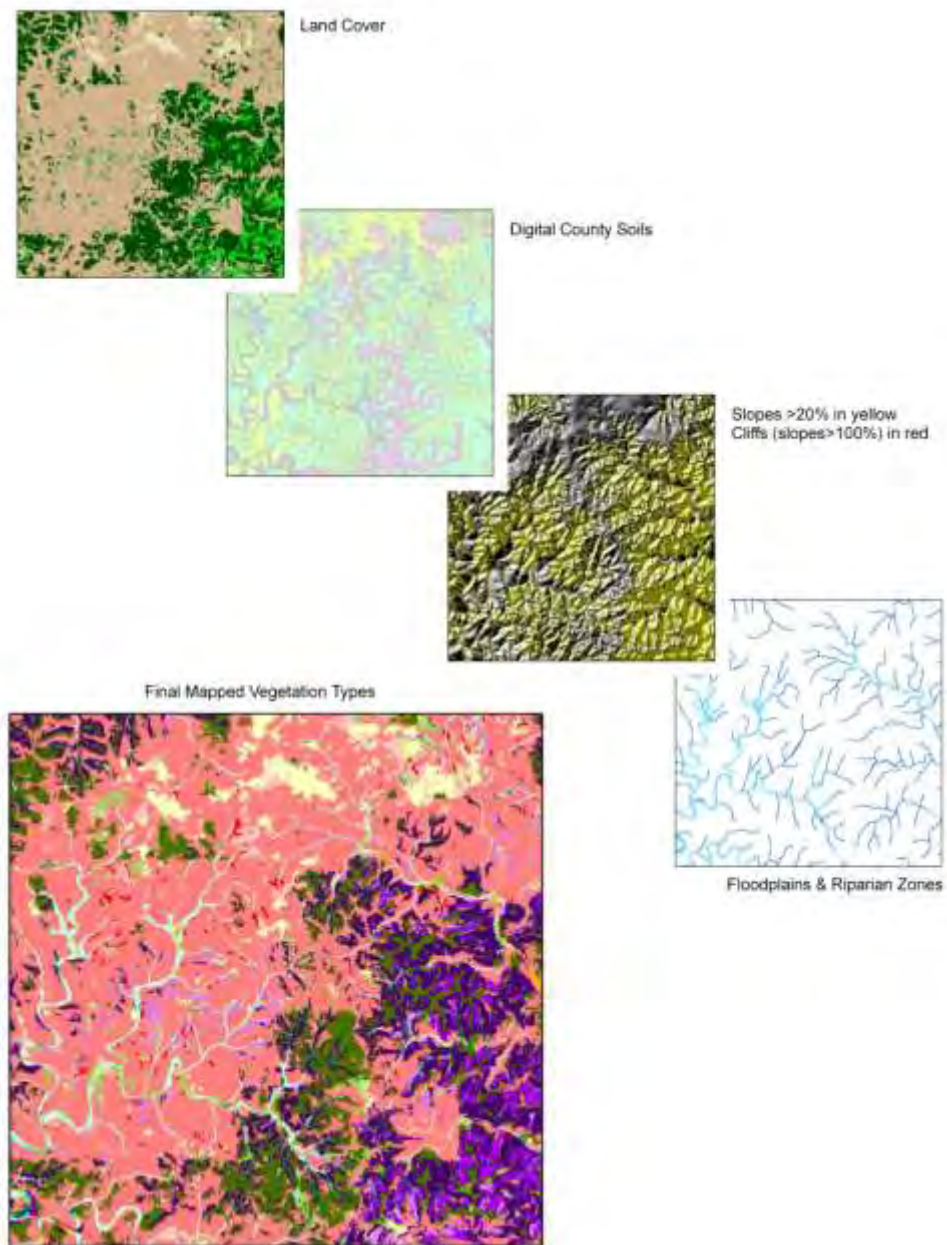
Figure 4. Example of data layers developed and used to map ecological systems, subsystems, and ruderal types.

Vegetation Modeling and Mapping.
Different combinations of landcover with different soils, slope, hydrology, or ecoregions
were assigned to different final mapped Ecological System and Mapping Subsystem
vegetation types. For example, the cold deciduous forest landcover type on a floodplain
was assigned and mapped as a floodplain ecological subsystem, whereas cold
deciduous forest on a slope >20% was assigned and mapped as a slope forest, and so
on (Figure 5).
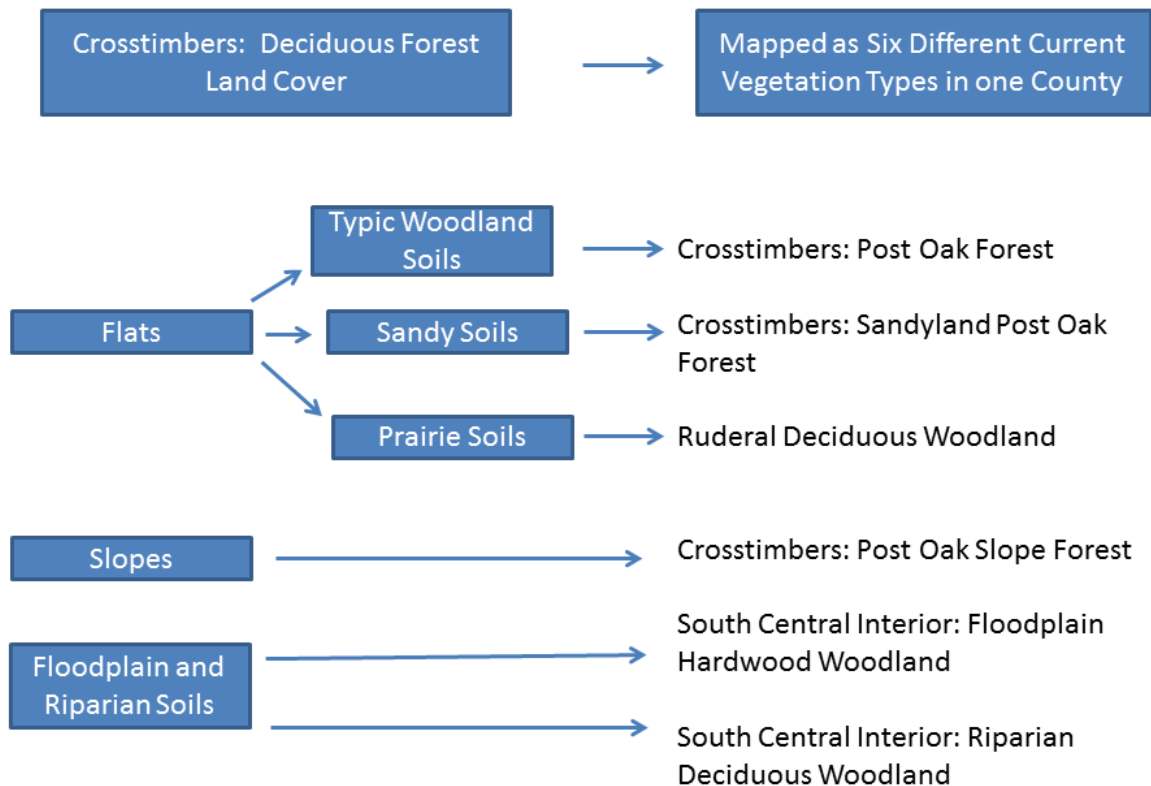
Figure 5. One landcover type (deciduous forest) may have been mapped as several different ecological
system or mapping subsystem vegetation types based on modeling by use of abiotic differences.

Python scripts accessing the ArcPy interface to ArcGIS were used to generate modeling
rules using combinations of land-cover and abiotic attributes. This provided a flexible
and transparent method for model implementation. Additionally, much of the basic
implementation of the models was accomplished inside MS Access using Visual Basic
for Applications (VBA) modules. Accomplishing this part of the task was much more
time efficient in MS Access than it was using complex joins and calculations within
ArcGIS.

Statewide Vegetation Summary

Quantitative vegetation plot data were taken from 3,709 georeferenced locations statewide. Plots were distributed by county, with the goal of placing roughly equivalent numbers of points in all counties in order to generate a representative statewide sample (Figure 6). Workers stopped at stream crossings along data collection routes, so bottomland and riparian samples are more abundant in the data set than on the landscape. In addition, notes were taken from 1,114 georeferenced points during the ground-truthing and map improvement process. Photos were taken at almost all plots, and at most points.
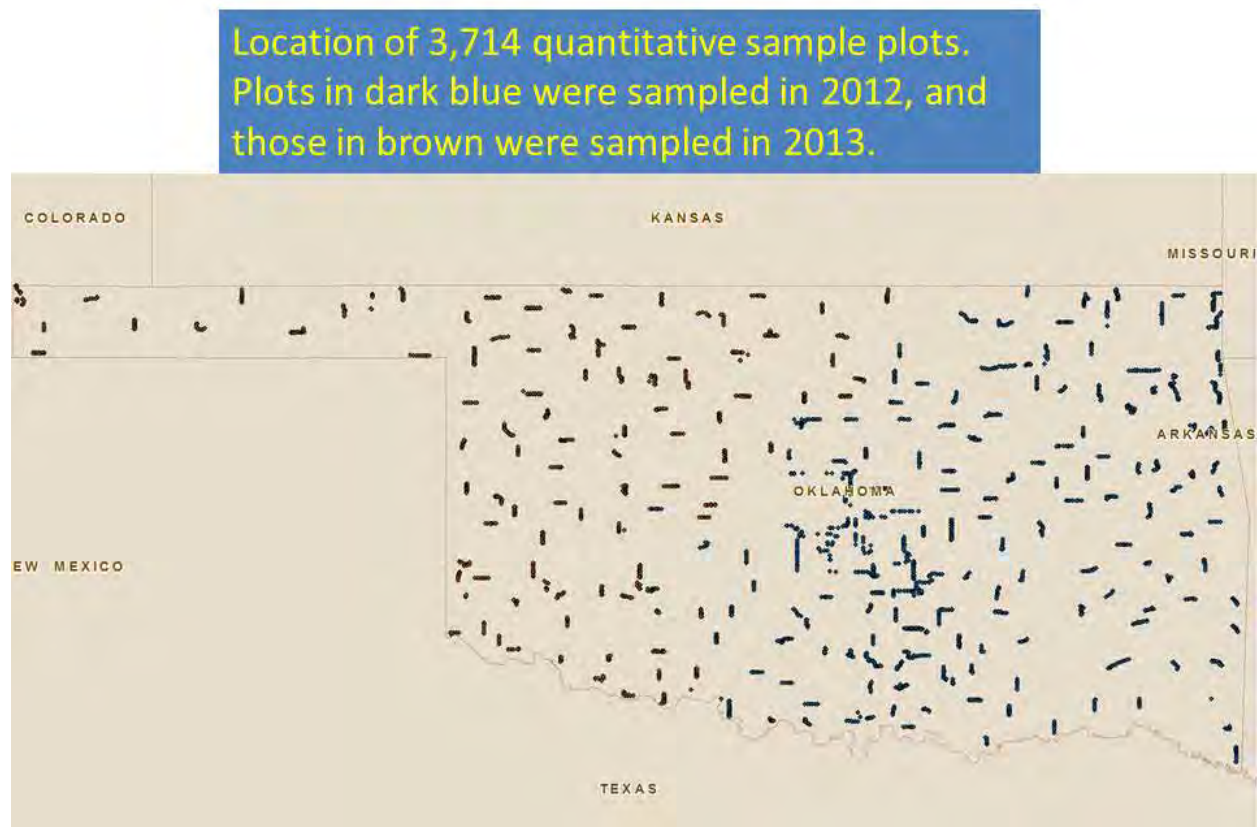
Figure 6. A total of 3,714 georeferenced sample points were distributed by county, with the goal of generating a representative sample across the entire state.

Accuracy of the land cover classification was checked largely using these points, plus other ground data collected to help drive the remote sensing classification. The overall User's Accuracy was 85.0% (Table 3).

Table 3. Total Use's Accuracy and per-class accuracy for land cover classification. Full confusion matrix is available from the authors.

Land Cover Class	Total Samples	Users Accuracy
barren	133	91.7%
deciduous woodland	536	90.2%
deciduous shrubland	357	60.2%
rowcorp agriculture	334	91.2%
evergreen shrubland	84	66.1%
herbaceous	1313	91.2%
coniferous evergreen woodland	208	85.3%
water	169	97.9%
high intensity urban	77	90.9%
low intensity urban	172	82.5%
herbaceous wetland	56	68.8%
mixed evergreen-deciduous woodland	121	59.5%
bottomland deciduous woodland	36	64.8%
Havard shin oak shinnery	90	75.4%
Total Samples & Accuracy	**3682**	**85.00%**

The ground-collected data, plus existing literature, were also used to draft the short descriptions contained in the body of this document. More complete, technical descriptions of ecological systems, mapping subsystems, and vegetation types were also drafted, and this 69-page text was provided as a separate document as a delivery product for this project.

A total of 493 species were found in plots statewide, including 82 that were recorded in the tree layer, 130 that were recorded in the shrub layer, and 357 that were recorded in the herbaceous layer (Appendix 1). A total of 76 woody species were recorded in both the tree and shrub layers.

A total of 85 species were found among the most important species in the tree, shrub, or herbaceous layers in more than 50 of 3,714 plots (Table 4). Of these, 41 were herbaceous species, 33 were found in the shrub layer, and 28 were found in the tree layer. A total of 17 woody species were found in more than 50 plots in both the tree and shrub layers.

Table 4. Most common species found in 3,714 plots.

Species	# of plots	Percent
Tree Layer		
Quercus stellata	618	16.7%
Quercus marilandica	379	10.2%

Species	# of plots	Percent
Carya illinoinensis	361	9.7%
Celtis laevigata	332	9.0%
Carya texana	235	6.3%
Juniperus virginiana	219	5.9%
Ulmus rubra	205	5.5%
Fraxinus pennsylvanica	191	5.1%
Ulmus alata	156	4.2%
Quercus velutina	156	4.2%
Populus deltoides	149	4.0%
Ulmus americana	147	4.0%
Ulmus pumila	133	3.6%
Quercus shumardii	132	3.6%
Platanus occidentalis	128	3.5%
Salix nigra	123	3.3%
Pinus echinata	114	3.1%
Quercus macrocarpa	109	2.9%
Maclura pomifera	101	2.7%
Carya alba	94	2.5%
Quercus muehlenbergii	90	2.4%
Quercus alba	83	2.2%
Gleditsia triacanthos	83	2.2%
Juglans nigra	80	2.2%
Quercus rubra	64	1.7%
Sapindus saponaria	60	1.6%
Acer negundo	60	1.6%
Prosopis glandulosa	57	1.5%
Shrub Layer		
Ulmus alata	525	14.2%
Juniperus virginiana	489	13.2%
Yucca glauca	301	8.1%
Symphoricarpos orbiculatus	281	7.6%
Celtis laevigata	267	7.2%
Quercus marilandica	246	6.6%
Ulmus rubra	214	5.8%
Quercus stellata	208	5.6%
Prosopis glandulosa	181	4.9%
Diospyros virginiana	179	4.8%
Cornus drummondii	177	4.8%
Cercis canadensis	175	4.7%
Prunus angustifolia	171	4.6%

Species	# of plots	Percent
Artemisia filifolia	160	4.3%
Ulmus americana	146	3.9%
Gleditsia triacanthos	136	3.7%
Salix nigra	135	3.6%
Opuntia macrorhiza	131	3.5%
Maclura pomifera	127	3.4%
Sideroxylon lanuginosum	122	3.3%
Rhus glabra	109	2.9%
Fraxinus pennsylvanica	97	2.6%
Carya illinoinensis	96	2.6%
Cornus florida	91	2.5%
Carya texana	85	2.3%
Acer negundo	79	2.1%
Opuntia phaeacantha	78	2.1%
Morus rubra	77	2.1%
Prunus serotina	71	1.9%
Sapindus saponaria	63	1.7%
Carya alba	59	1.6%
Ulmus pumila	57	1.5%
Rhus trilobata	56	1.5%
Herbaceous Layer		
Cynodon dactylon	859	23.2%
Smilax bona-nox	711	19.2%
Bromus arvensis	609	16.4%
Elymus canadensis	366	9.9%
Ambrosia psilostachya	346	9.3%
Bromus tectorum	345	9.3%
Schizachyrium scoparium	330	8.9%
Amphiachyris dracunculoides	327	8.8%
Schedonorus phoenix	309	8.3%
Sorghum halepense	262	7.1%
Vitis cinerea	241	6.5%
Toxicodendron radicans	236	6.4%
Bothriochloa laguroides	227	6.1%
Parthenocissus quinquefolia	223	6.0%
Triticum aestivum	179	4.8%
Bromus catharticus	164	4.4%
Bouteloua curtipendula	149	4.0%
Chasmanthium latifolium	149	4.0%
Panicum virgatum	142	3.8%

Species	# of plots	Percent
Lespedeza cuneata	125	3.4%
Gutierrezia sarothrae	121	3.3%
Artemisia ludoviciana	109	2.9%
Sporobolus cryptandrus	105	2.8%
Bouteloua gracilis	104	2.8%
Ampelopsis cordata	96	2.6%
Bothriochloa ischaemum	94	2.5%
Danthonia spicata	90	2.4%
Andropogon gerardii	90	2.4%
Campsis radicans	85	2.3%
Tridens flavus	83	2.2%
Hordeum pusillum	81	2.2%
Lonicera japonica	79	2.1%
Helenium amarum	76	2.0%
Ambrosia trifida	63	1.7%
Lolium perenne	62	1.7%
Croton monanthogynus	57	1.5%
Setaria parviflora	56	1.5%
Ambrosia artemisiifolia	55	1.5%
Unknown	54	1.5%
Solidago ulmifolia	53	1.4%
Xanthium strumarium	50	1.3%

Bermudagrass (*Cynodon dactylon*) was the most commonly encountered species, occurring in 859 plots, or 148 more (17.2% more) than the next most common species, saw greenbriar (*Smilax bona-nox*). Other common species in the herbaceous layer included field brome (*Bromus arvensis*), Canada wildrye (*Elymus canadensis*), western ragweed (*Ambrosia psilostachya*), and cheatgrass (*Bromus tectorum*). Three of the six most commonly encountered herbaceous species were non-native. The most commonly encountered trees were post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), pecan (*Carya illinoinensis*), and sugar hackberry (*Celtis laevigata*). Post oak was 38.7% more common than the next most common species. The most common species recorded in the shrub layer was winged elm (*Ulmus alata*), followed by eastern redcedar (*Juniperus virginiana*), soapweed yucca (*Yucca glauca*), and coralberry (*Symphoricarpos orbiculatus*). Species that were common in both the tree and shrub layers included sugar hackberry, blackjack oak, post oak, and eastern redcedar.

A total of 166 vegetation types were mapped for Oklahoma (Appendix 2). Of these, 87, or 52.7% of the total, made up less than 10,000 hectares each, and 30 less than 1,000 hectares each. Row crops, Crosstimbers: Pasture/Prairie, and Central Mixedgrass:

Prairie/Pasture each accounted for more than 10% of the area of the state, and together made up 41.6% of the state (Table 5). The most common grassland types, including those in the Crosstimbers, Central Mixedgrass, High Plains Shortgrass, and Osage Tallgrass regions together account for just over a third of the area of the state. The most common forest type was Crosstimbers: Post Oak – Blackjack Oak Forest and Woodland, which covered 1,035,809 hectares, or 5.7% of the state. This forested vegetation type was less than half the area of grasslands in the Crosstimbers region. The Ozark-Ouachita: Dry Oak Woodland type covered the most area in the more forested eastern and southeastern part of the state. Ruderal Deciduous Woodland was the most common woody-dominated disturbance/cultural type mapped, followed by Pine Plantation, Ruderal Deciduous Shrubland and Young Woodland, and Ruderal Eastern Redcedar Woodland and Shrubland, which covered 62,994 hectares, or 0.35% of the state. Planted Non-native and/or Native Grasses, which represents fairly recently retired cropland, was conservatively mapped only in the panhandle and adjacent western Oklahoma counties but still accounted for 507,456 hectares, or 2.8% of the state, and was the eighth most abundant mapped type.

Table 5. Mapped types with more than 50,000 hectares total area in Oklahoma.

Mapped Type Name	Brief Description	Area (HA)	Percent
Row Crops	This type includes all cropland where fields are fallow for some portion of the year. Some fields may rotate into and out of cultivation frequently, and year-round cover crops and tame hay fields are generally mapped as grassland/pasture types.	2,878,196.6	15.899%
Crosstimbers: Pasture/Prairie	This type is mapped essentially from the southern border to the northern border of Oklahoma, and across the east to west extent of the Crosstimbers and transition zone to central Oklahoma. In the modern landscape, non-native and grazing-tolerant species dominant most areas. Common species include Bermudagrass, field brome, western (Cuman) ragweed, and tall fescue. More lightly-grazed areas or hay meadows may have species such as little bluestem, silver bluestem, switchgrass, big bluestem, sideoats grama, and yellow Indiangrass. Woody species such as post oak, pecan, blackjack oak, winged elm, eastern redcedar, honeylocust, Osage orange, and common persimmon may be components.	2,498,205.4	13.800%
Central Mixedgrass: Prairie/Pasture	This type circumscribes a variety of grasslands in different conditions across broad gradients in both moisture and temperature. In the modern landscape, non-native and grazing-tolerant species such as field brome, Bermudagrass, prairie broomweed, cheatgrass, three-awn species, hairy grama, other grama species, buffalograss, and western ragweed are common. Species such as little bluestem, silver bluestem, and sideoats grama may be more important in less heavily grazed areas, especially to the east within this type. Woody components may include mesquite (south), eastern redcedar, Osage orange, and honeylocust.	2,162,501.4	11.946%
Crosstimbers: Post Oak - Blackjack Oak Forest and Woodland	This type is mapped on typical woodland soils across a wide swath of central Oklahoma. Woodland quality and successional state varies within the type. Common dominants include post oak, blackjack oak, black hickory, black oak, winged elm, pecan, and Shumard oak. Eastern redcedar is a common component. Understory species may include coralberry, eastern redbud, rough dogwood, common persimmon, and gum bumelia.	1,035,809.0	5.722%
Osage Plains: Tallgrass Prairie/Pasture	This type circumscribes a variety of mainly grazed grasslands, but some native hay meadows are also represented. In the modern landscape, non-native and grazing-tolerant species such as Bermudagrass, tall fescue, field brome, western (Cuman) ragweed, prairie broomweed, and sericea lespedeza are common. Some areas have native tallgrass elements such as little bluestem, switchgrass, big bluestem, heath aster, and Canada goldenrod. Woody elements may include common persimmon, eastern redcedar, sugar hackberry, elm species, and honeylocust.	812,104.1	4.486%
Ozark-Ouachita: Dry Oak Woodland	This common and broadly circumscribed type is mapped on upland flats and moderate slopes. Common tree species include post oak, white oak, black oak, blackjack oak, black hickory, other hickory species, slippery elm, sugar hackberry, and black walnut. Shortleaf pine or eastern redcedar may also be components in low density.	654,607.8	3.616%
High Plains: Shortgrass Prairie	This type is mapped over a broad range of generally medium-textured soils of the High Plains, and grades into Central Mixedgrass types to the east. Grazing-tolerant species such as blue grama, buffalograss, sand dropseed, broom snakeweed, soapweed yucca, and Opuntia species are common in the modern landscape. Mid grasses such as little bluestem, sideoats grama, and silver bluestem are often important. Other common herbaceous species may include plains blackfoot and Rocky Mountain zinnia. Sand sagebrush, white sagebrush, and soapweed yucca are common woody components.	637,366.3	3.521%

Mapped Type Name	Brief Description	Area (HA)	Percent
Planted Non-native and/or Native Grasses	Grasslands or pasture typically planted with native grasses such as sideoats grama or little bluestem. Non-native grasses such as yellow bluestem or weeping lovegrass may be dominant or present.	507,456.2	2.803%
Urban Low Intensity	This type includes areas that are built-up or partially cleared of vegetation but not entirely covered by impervious cover, and includes most of the non-industrial areas within cities and towns.	489,168.3	2.702%
South Central Interior: Bottomland Hardwood Forest	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common canopy dominants may include pecan, green ash, slippery elm, sycamore, sugar hackberry, honeylocust, boxelder, Shumard oak, bur oak, black willow, and American elm. Vines such as eastern poison ivy, grape species, peppervince species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as Virginia wildrye, Indian woodoats, longleaf woodoats, Johnsongrass, Bermudagrass, and sedge species.	436,959.8	2.414%
Ozark-Ouachita: Pasture/Prairie	This type circumscribes broad variation, but in the modern landscape most representatives are grazed pastures. Common species are non-native and grazing tolerant grasses and forbs such as Bermudagrass, tall fescue, annual ragweed, field brome, purple top tridents, sericea lespedeza, prairie broomweed, and sneezeweed. Less heavily grazed areas may support grasslands with species such as little bluestem, big bluestem, and yellow Indiangrass. Woody species such as post oak, black walnut, common persimmon, winged elm, sumac species, and eastern redcedar may be components.	388,110.5	2.144%
High Plains: Sand Prairie	This type is mapped over aeolian or alluvial deep sands. Common herbaceous species in the modern landscape include little bluestem, sand bluestem, switchgrass, sand dropseed, sand lovegrass, sandburs, western ragweed, field brome, cheatgrass, Bermudagrass, and giant sandreed. Common shrubs include sand sagebrush, Chickasaw plum, Havard shin oak (within range), and soapweed yucca.	351,966.6	1.944%
Ruderal Deciduous Woodland	This type is mapped on prairie soils across much of the state and consists mainly of relatively closed woodlands that vary a great deal in composition. Common woody species may include hackberry species, pecan, green ash, other ash species, elm species, honeylocust, black locust, catalpa, western soapberry, oak species, winged elm, and Osage orange. Eastern redcedar may be a component.	345,434.6	1.908%
Open Water	This type was open water during all seasons at the time of data acquisition for the current classification (circa 2012).	330,377.5	1.825%
Ozark-Ouachita: Dry-Mesic Oak Forest	This type was mapped over slopes >20% and on low flats. Closed-canopy forests with species such as white oak, hickory species, black oak, northern red oak, and chinkapin oak are characteristic of this type. The most mesic areas may contain sugar maple as an important component. Flowering dogwood, redbud, hophornbeam, and sassafras are common woody understory species.	322,587.6	1.782%
Ozark-Ouachita: Shortleaf Pine - Oak Forest	This type includes mixed stands of shortleaf or loblolly pine and oaks, and includes more natural stands as well as areas that are more intensively managed for forest products. These areas had generally not been clear-cut in the period from 2000 to 2012. Important trees may include post oak, black or mockernut hickory, black oak, white oak, northern or southern red oak, and blackjack oak. Common understory species may include flowering dogwood, hophornbeam, winged elm, St. Johnswort, and farkleberry.	277,833.9	1.535%
Flint Hills: Tallgrass Prairie/Pasture	This type occurs mainly over unbroken sod in grazed pastures in the modern landscape, but some native hay meadows are also present. Common grazing-tolerant species include field brome, tall fescue, silver bluestem, prairie broomweed, and western (Cuman) ragweed. Tallgrass prairie elements may include little bluestem, big bluestem, switchgrass, heath aster, leadplant, Canada goldenrod, and gayfeather species. Woody plants such as eastern redcedar, honeylocust, pecan, common persimmon, and Chickasaw plum may be present.	218,985.6	1.210%

Mapped Type Name	Brief Description	Area (HA)	Percent
Pine Plantation	This type consists mainly of loblolly pine plantations, although shortleaf pine is also planted. These areas were mature enough to be dominated by pines at the time of satellite data collection (circa 2012).	216,846.3	1.198%
High Plains: Bottomland Hardwood Forest	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Typical canopy trees include sugar hackberry, plains cottonwood, bur oak, winged soapberry, boxelder, American elm, green ash, honeylocust, Siberian elm, pecan, and soapberry.	183,669.4	1.015%
Crosstimbers: Sandyland Shrubland and Grassland	This type is mapped over more or less deep sands and in the modern landscape if most often represented by grazed pasture with non-native and grazing-tolerant species such as Bermudagrass, tall fescue, annual ragweed, weeping lovegrass, Johnsongrass, and sandbur species. Overall herbaceous species diversity tends to be fairly high over deeper sand, and some may contain species such as little bluestem, pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack. Common woody components include Chickasaw plum, post oak, winged elm, and blackjack oak.	166,932.7	0.922%
Arkansas Valley: Prairie/Pasture	This type circumscribes a variety of grasslands. In the modern landscape, non-native and grazing-tolerant species such as Bermudagrass, field brome, marsh bristlegrass, thickspike tridens, and tall fescue are common components. Some native hay meadows or lightly grazed native sod may be dominated by native prairie species such as little bluestem, switchgrass, yellow Indiangrass, and big bluestem.	164,770.2	0.910%
Ruderal Deciduous Shrubland and Young Woodland	This type is mapped on prairie soils across much of the state and consists of mainly successional young woodlands or shrublands, although some more natural communities may occur. Common components vary from region to region, and may include honeylocust, winged elm, black locust, post oak, blackjack oak, pecan, Chickasaw plum, western soapberry, common persimmon, green ash, sumac species, hackberry species, elm species, and Osage orange. Eastern redcedar is not a major component of these communities but may be present.	164,504.4	0.909%
West Gulf Coastal Plain: Pasture	This type is mainly represented by grazed pastures with non-native and grazing-tolerant species in the modern landscape. Common species may include Bermudagrass, little bluestem, prairie broomweed, prairie tea, tall fescue, field brome, and Johnsongrass. Woody species may include winged elm, sugar hackberry, possumhaw, green ash, and eastern redcedar.	163,443.4	0.903%
Central Mixedgrass: Sandy Prairie/Pasture	In the modern landscape, this type is mainly represented by grazed pastures with species such as cheatgrass, western ragweed, sand dropseed, field brome, King Ranch Bluestem, and Bermudagrass common. Areas with less grazing pressure have species such as little bluestem, sideoats grama, silver bluestem, blue grama, and big bluestem. Other common species include snake broomweed, prairie broom weed, white sagebrush, and soapweed yucca. Eastern redcedar, honey mesquite (within range), sand sagebrush, and Chickasaw plum may be present.	141,365.3	0.781%
High Plains: Sandhill Shrubland	This type is mapped over aeolian and alluvial deep sands where woody species other than Havard shin oak are the prevailing dominants, although it may be present, within range. The type often occurs interspersed with grasslands. Common species in the modern landscape include sand sagebrush, fragrant sumac, Chickasaw plum, sand bluestem, sand dropseed, cheatgrass, western ragweed, soapweed yucca, grama species, Schweinitz flatsedge, yellow sundrops, and annual buckwheat.	137,255.1	0.758%
South Central Interior: Riparian Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common canopy dominants may include pecan, post oak, Shumard oak, green ash, slippery elm, sycamore, sugar hackberry, honeylocust, boxelder, bur oak, black willow, and American elm.	127,444.0	0.704%

Mapped Type Name	Brief Description	Area (HA)	Percent
Post Oak Savanna: Pasture/Grassland	This type is mainly represented by grazed pastures dominated by non-native and grazing-tolerant species in the modern landscape. Common components include Bermudagrass, field brome, tall fescue, western (Cuman) ragweed, purpletop tridens, and silver bluestem. Woody components may include post oak, winged elm, Osage orange, pecan, honeylocust, water oak, and eastern redcedar.	119,156.2	0.658%
West Gulf Coastal Plain: Dry Upland Hardwood Forest	This type circumscribes forests that are mainly in a variety of states of recovery from human disturbance, and over a variety of soil moisture regimes. Common species may include white oak, southern red oak, post oak, water oak, sweetgum, hickory species, sugar hackberry, elm species, and green ash. Loblolly or shortleaf pine may be a component.	90,260.9	0.499%
High Plains: Riparian Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. A wide variety of canopy trees may be important, including plains cottonwood, bur oak, sycamore, winged soapberry, Siberian elm, sugar hackberry, willow species, boxelder, elm species, gum bumelia, ash species, and honeylocust.	86,183.4	0.476%
Southeastern Great Plains: Bottomland Hardwood Forest	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common tree species include American elm, green ash, bur oak, sugar hackberry, slippery elm, black willow, sycamore, boxelder, black walnut, Shumard oak, western soapberry, and pecan. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as Virginia wildrye, Bermudagrass, Johnsongrass, field brome, Indian woodoats, longleaf woodoats, and sedge species.	85,704.8	0.473%
Arbuckle: Prairie/Pasture	In the modern landscape, this type is mainly dominated by grazing-tolerant native or non-native species such as field brome, Bermudagrass, prairie broomweed, purple three-awn, and silver bluestem. Woody species such as sugar hackberry, winged elm, honeylocust, and juniper species may be components.	82,776.9	0.457%
Ozark-Ouachita: Riparian Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Stream gradient tends to be relatively high, and species such as sycamore, river birch, sweetgum, maples, oaks, and hazel alder may grow near steep banks or adjacent to stream bed cobble.	79,975.7	0.442%
West Gulf Coastal Plain: Large River Bottomland Hardwood Forest	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common overstory trees may include water oak, pecan, willow oak, sugar hackberry, post oak, sweetgum, green ash, blackgum, slippery elm, American elm, sycamore, and black willow. Shrubs such as common buttonbush and river birch may occur in well-watered areas.	72,711.3	0.402%
Crosstimbers: Young Post Oak - Blackjack Oak Woodland	This type represents pastures and woodland edges with sparse successional vegetation, including shrubs and trees. Common woody species include blackjack oak, post oak, winged elm, sumac species, hackberry species, common persimmon, honeylocust, gum bumelia, and pecan. Herbaceous areas have species such as Bermudagrass, field brome, tall fescue, purpletop tridens, little bluestem, and silver bluestem. Vines such as eastern poison ivy and greenbriar species are common.	71,701.7	0.396%
Crosstimbers: Sandyland Post Oak - Blackjack Oak Forest and Woodland	This type is mapped over more or less deep, wind- or water-deposited sands. Common trees include post oak, blackjack oak, black hickory, sugar hackberry, and pecan. Open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.	70,360.8	0.389%

Mapped Type Name	Brief Description	Area (HA)	Percent
Canyon: Gyp Grassland	This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches or layers of gyp on slopes are common. Short and mid-grasses such as sideoats grama, blue grama, hairy grama, little bluestem, cane bluestem, sand dropseed, and annual bromes are also common. Forbs common in the modern landscape include broom snakeweed, common broomweed, stiff greenthread, Navajo tea, Indian breadroot, stemmy four-nerve daisy, sundrops species, and western ragweed. Important shrubs may include skunkbush sumac, lotebush, mesquite (within range), and Mohr shin oak. Succulents such as soapweed yucca, pricklypear, and Christmas cactus may be present. Pinchot's juniper, or less commonly, eastern redcedar may be present.	67,378.6	0.372%
Ruderal Eastern Redcedar Woodland and Shrubland	This type is mapped on prairie soils across much of the state, and ranges from relatively dense woodlands to more open shrublands where eastern redcedar is a significant component. Common woody components vary by region, and may include hackberry species, winged elm, other elm species, green ash, other ash species, honeylocust, black locust, western soapberry, lotebush, post oak, and Osage orange.	62,994.0	0.348%
Crosstimbers: Post Oak - Blackjack Oak Slope Forest	This type is mapped on slopes >20% and composition is similar to Crosstimbers: Post Oak Forest, although these stands tend to have more canopy and more often contain older trees. Common components include post oak, blackjack oak, black hickory, black oak, green ash, winged elm, redbud, and rough dogwood.	62,940.2	0.348%
High Plains: Sandy Deciduous Shrubland	This type is over or near sandy soils, but not mapped on deep sands. Components of the High Plains: Sand Prairie such as sand sagebrush, soapweed yucca, Chickasaw plum, little bluestem, sand dropseed, sand lovegrass, sandburs, western ragweed, field brome, cheatgrass, and Bermudagrass are common. However, components associated with deep sands such as sand bluestem and giant sandreed are generally lacking.	59,790.8	0.330%
Pine Plantation - 1 - 3 meters	This type consists of young pine plantations that were not mature enough to be clearly dominated by pines at the time of data collection (circa 2012).	59,106.0	0.326%
High Plains: Bottomland Deciduous Shrubland	This type is mainly represented by successional shrublands or young woodlands in the modern landscape. Species such as black willow, Chickasaw plum, winged elm, winged soapberry, plains cottonwood, green ash, honeylocust, Siberian elm, willow species, and elm species may be present.	53,997.1	0.298%
Ruderal Plains Shrubland	This type is mapped over prairies soils of western Oklahoma, and may contain a wide variety of shrubs and patches of trees that increase under grazing pressure. This may is species such as soapweed yucca, sand sagebrush, white sagebrush, tree cholla, Chickasaw plum, Siberian elm, sugar hackberry, and soapberry. Herbaceous species common include broom snakeweed, plains broomweed, and short grasses such as grama species, sand dropseed, and brome species.	53,648.6	0.296%

Short Descriptions and Range Maps

Following are short descriptions for mapped types accompanied by range maps. Short descriptions are based on data summarized from field points, Ecological Systems descriptions provided by NatureServe, and descriptions provided in Hoagland (2000) and Bruner (1931). Modern landscapes are generally disturbed by human activity, including grazing, timber management, and past cultivation. These disturbed landscapes where non-native and native ruderal species are important have not been the focus for ecologists in terms of providing quantitative or even qualitative descriptions. Thus, ironically, very common types on the modern landscape may be fairly poorly described in the literature. In addition, mapped types often circumscribe fairly wide variation in community composition. For these reasons, many of the type descriptions are quite general, and apply to the majority of the area of the type, but not all representatives on the landscape. Additional field data will improve these descriptions over time. Common names follow those in the USDA Plants database (http://plants.usda.gov/java/). The colors on range maps represent relative abundance of a type. Pictures were taken as field sampling data points were collected in the field and reflect this quality, and not all mapped types have photos.

Arbuckle: Ashe Juniper Shrubland

Area: 11,938 acres (4,831 ha)

Description of Mapped Type: This type contains Ashe juniper among the dominants together with deciduous shrubs and trees. Important components may include stretchberry (elbow-bush), eastern redbud, gum bumelia, scaleybark (bastard) oak, chinkapin oak, post oak, blackjack oak, and winged elm. Eastern redcedar may replace Ashe juniper in some stands.

Arbuckle: Ashe Juniper Woodland

Area: 8,079 acres (3,269 ha)

Description of Mapped Type: This type is characterized by Ashe juniper among the dominant species in the tree or shrub layer, or both. Other common deciduous trees and shrubs may include Buckley oak, Texas ash, scaleybark (bastard) oak, stretchberry (elbow-bush), sugar hackberry, gum bumelia, slippery elm, and chinkapin oak. Eastern redcedar may be a component, replacing Ashe juniper, in some stands.
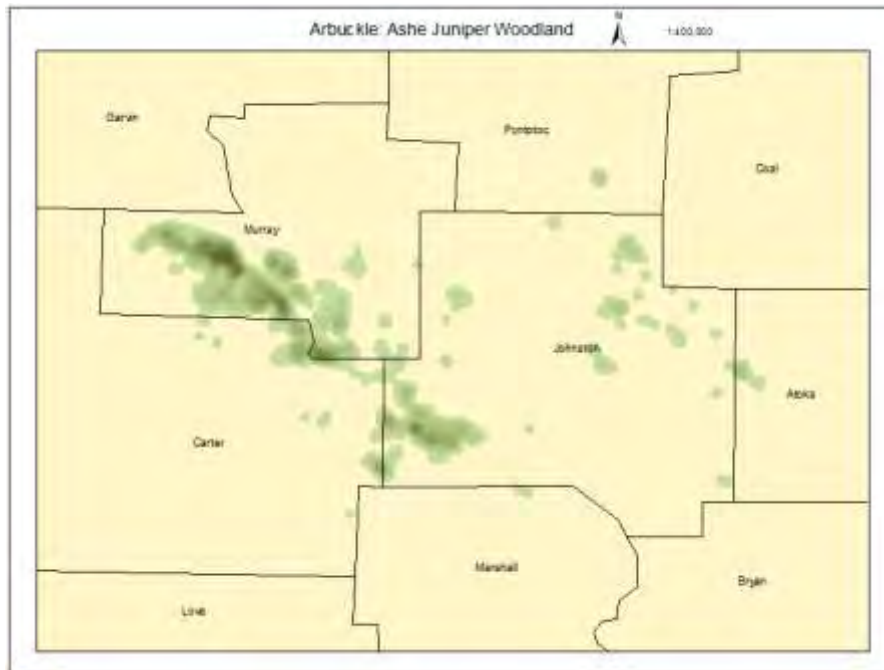
Arbuckle: Deciduous Shrubland

Area: 6,423 acres (2,599 ha)

Description of Mapped Type: This type is dominated by deciduous shrubs and small or sparse trees but may contain Ashe juniper or eastern redcedar as a component. Common woody components may include stretchberry (elbow-bush), eastern redbud, gum bumelia, scaleybark (bastard) oak, post oak, blackjack oak, chinkapin oak, and winged elm.
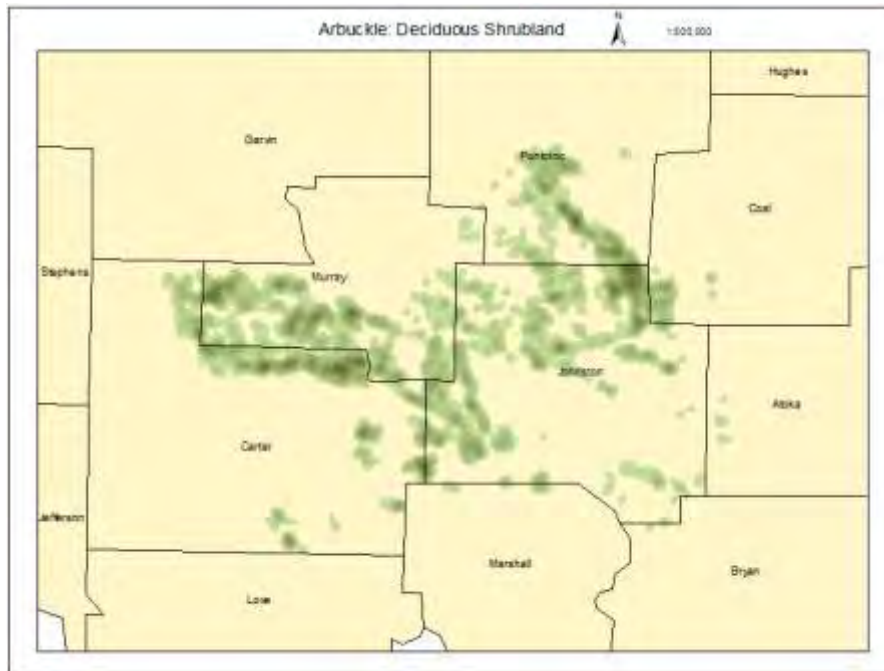
Arbuckle: Juniper Slope Forest

Area: 2,955 acres (1,196 ha)

Description of Mapped Type: This type is mapped on slopes >20%, and includes sites over more or less calcareous soils.   Composition is similar to the Arbuckle: Ashe Juniper Woodland, but stands tend to be more dense and more diverse. Ashe juniper, eastern redcedar, post oak, blackjack oak, Buckley oak, scaleybark (bastard) oak, Texas ash, stretchberry (elbow-bush), and chinkapin oak are common components.
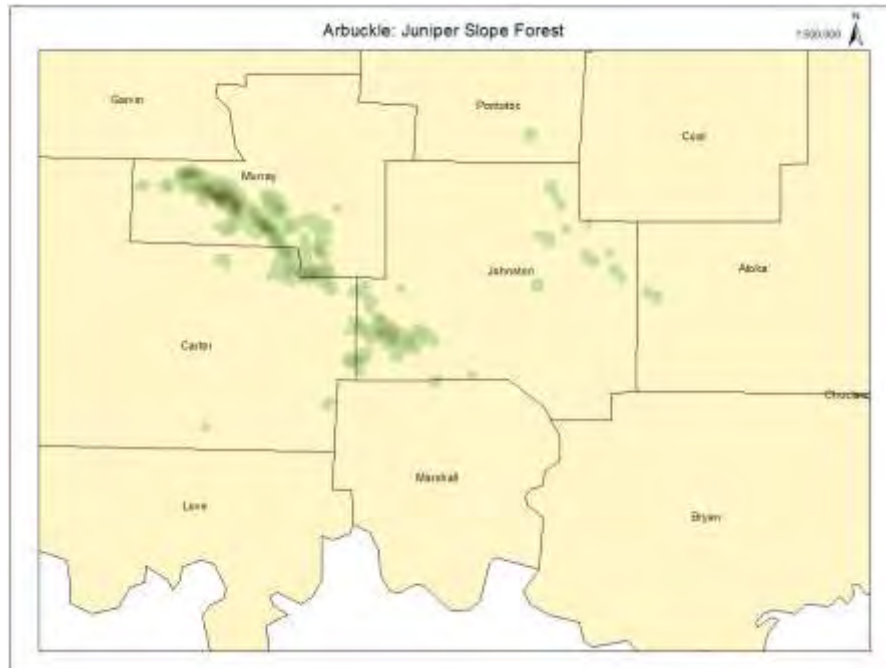
Arbuckle: Oak-Juniper Slope Forest

Area: 674 acres (272 ha)

Description of Mapped Type: This type is mapped on slopes >20%, and includes sites over more or less calcareous soils. Composition depends mainly on substrate, with species such as Buckley oak, chinkapin oak, Shumard oak, and Texas ash occurring over limestones and species such as post oak, bitternut hickory, black oak, and blackjack oak more important over acidic substrates. Sugar hackberry, winged elm, Ashe juniper, eastern redcedar, and slippery elm are other common woody components.
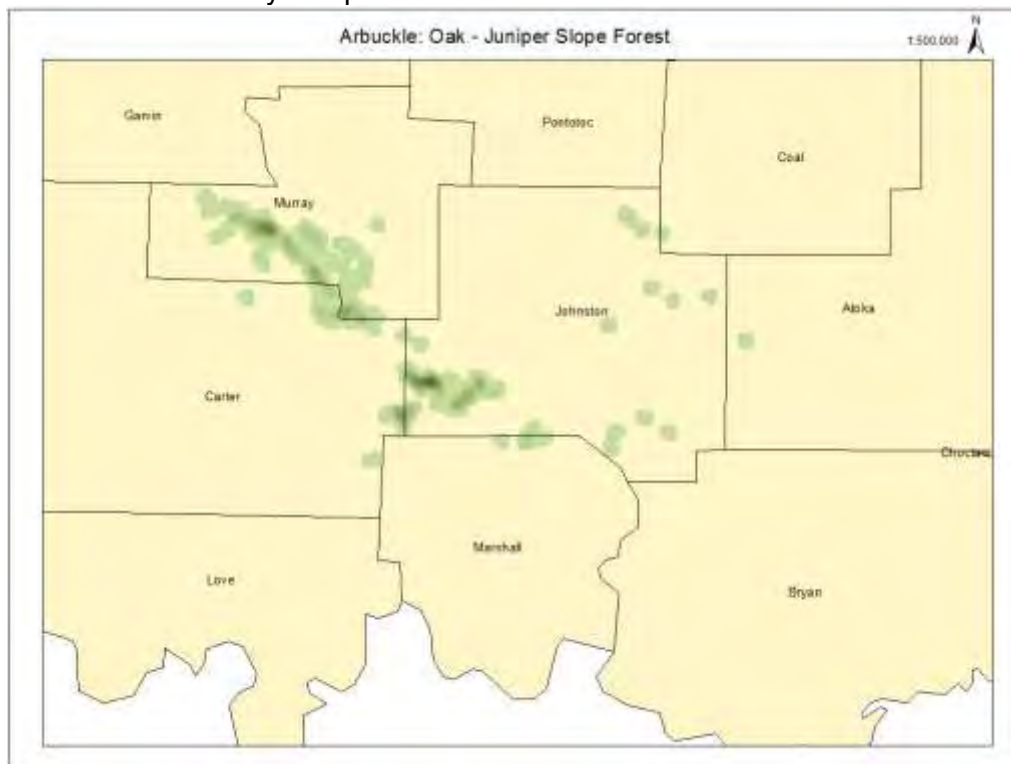
Arbuckle: Oak - Juniper Woodland

Area: 1,272 acres (515 ha)

Description of Mapped Type: This type is mapped over limestone (more calcareous) and dolomite (less calcareous) soils. Ashe juniper is more important over limestone, whereas eastern redcedar is more important over less calcareous soils. Important deciduous species include post oak, sugar hackberry, blackjack oak, chinkapin oak, Buckley oak, black oak, and winged elm.
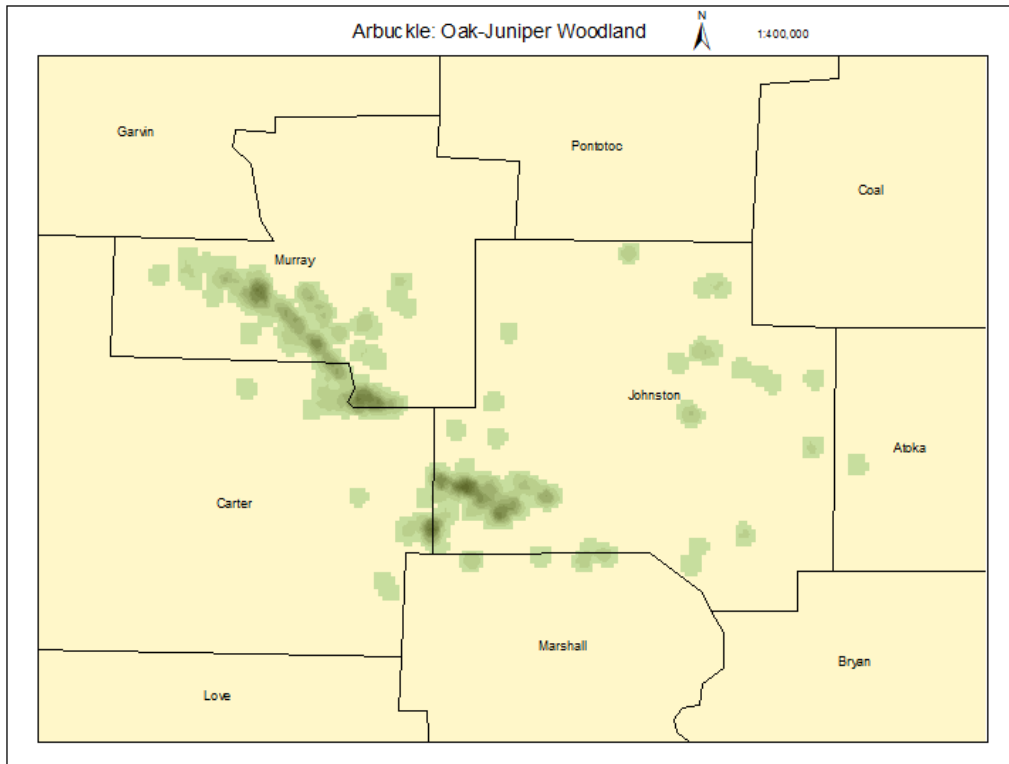
Arbuckle: Oak Slope Forest

Area: 12,492 acres (5,055 ha)

Description of Mapped Type: This type is mapped on slopes >20% and may include a fairly wide diversity of overstory trees. Common components include post oak, chinkapin oak, Buckley's oak, black oak, Texas ash, bitternut hickory, and Shumard oak. Ashe juniper or eastern redcedar are often components, and eastern redbud, gum bumelia, and elbowbush are common in the understory.
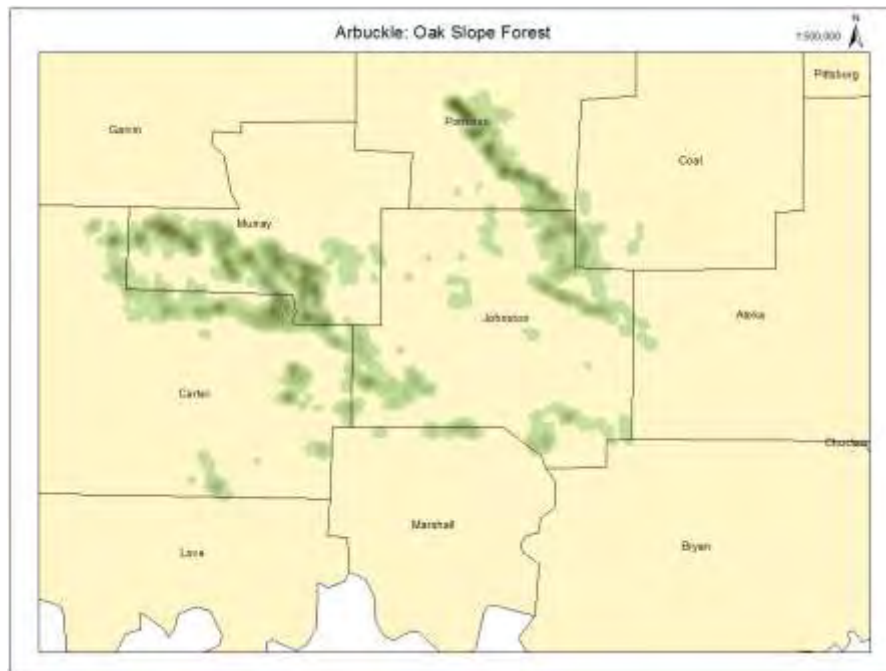
Arbuckle: Oak Woodland

Area: 45,949 acres (18,594 ha)

Description of Mapped Type: This type may occur over limestone (more calcareous) or dolomite (less calcareous) soils. Important deciduous species may include post oak, blackjack oak, black oak, chinkapin oak, winged elm, sugar hackberry, Shumard oak, and Buckley oak. Ashe juniper is common over limestones whereas eastern redcedar is common on less calcareous soils.
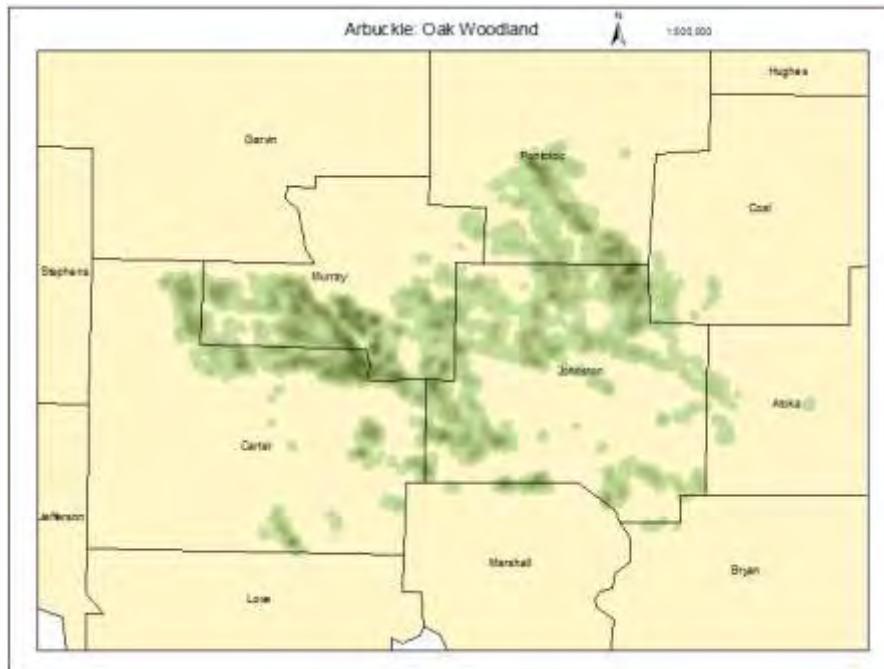
Arbuckle: Prairie/Pasture

Area: 204,546 acres (82,777 ha)

Description of Mapped Type: In the modern landscape, this type is mainly dominated by grazing-tolerant native or non-native species such as field brome, Bermudagrass, prairie broomweed, purple three-awn, and silver bluestem. Woody species such as sugar hackberry, winged elm, honeylocust, and juniper species may be components.

Arkansas Valley: Prairie/Pasture

Area: 407,155 acres (164,770 ha)

Description of Mapped Type: This type circumscribes a variety of grasslands. In the modern landscape, non-native and grazing-tolerant species such as Bermudagrass, field brome, marsh bristlegrass, thickspike tridens, and tall fescue are common components. Some native hay meadows or lightly grazed native sod may be dominated by native prairie species such as little bluestem, switchgrass, yellow Indiangrass, and big bluestem.
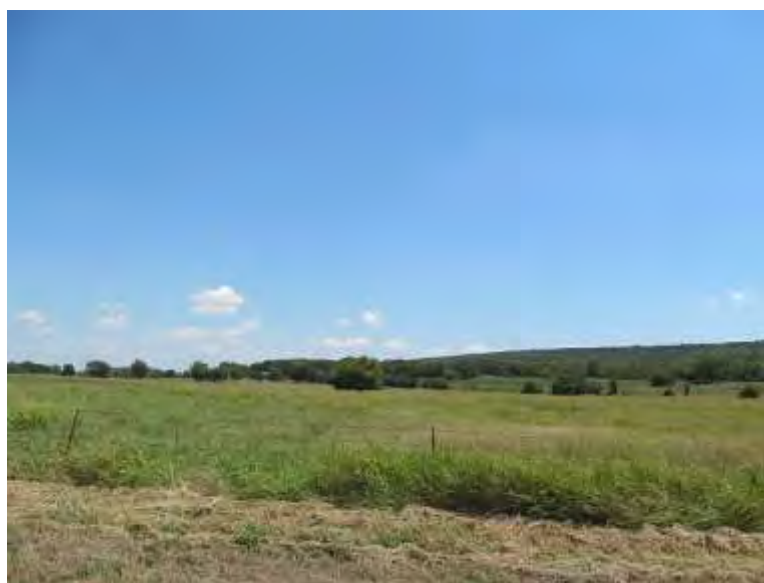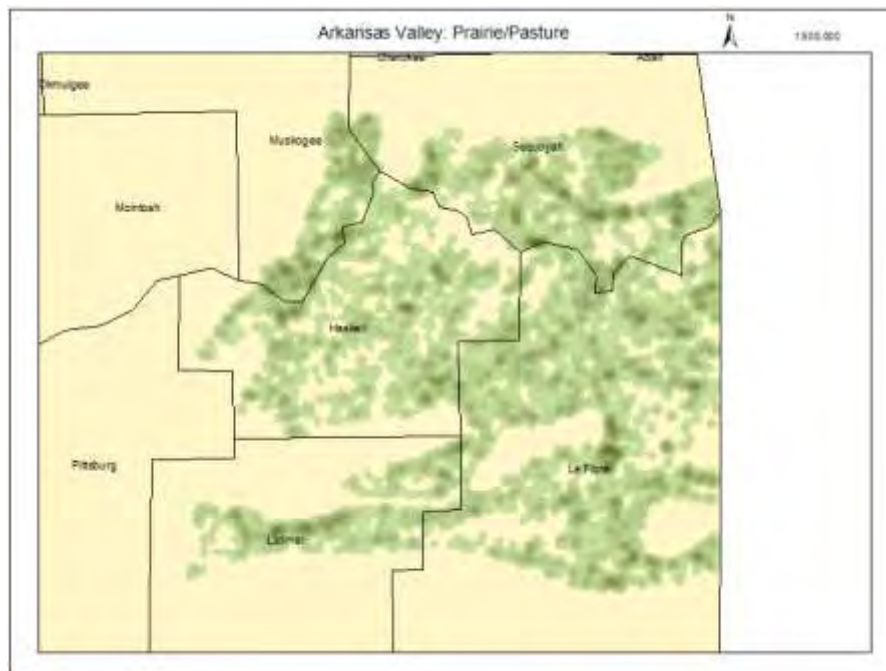
Arkansas Valley: Sandy Prairie/Pasture

Area: 2,462 acres (997 ha)

Description of Mapped Type: This type occurs over more or less deep sands of the Arkansas River valley in far eastern Oklahoma, and consists mainly of grazed pastures in the modern landscape, although some areas of native hay and disturbed sands near the river also occur. Common components include Bermudagrass, field borne, thickspike tridens, and silver bluestem. Native hay meadows have species such as big bluestem, switchgrass, little bluestem, and yellow Indiangrass.

Arkansas Valley: Sandy Prairie/Pasture
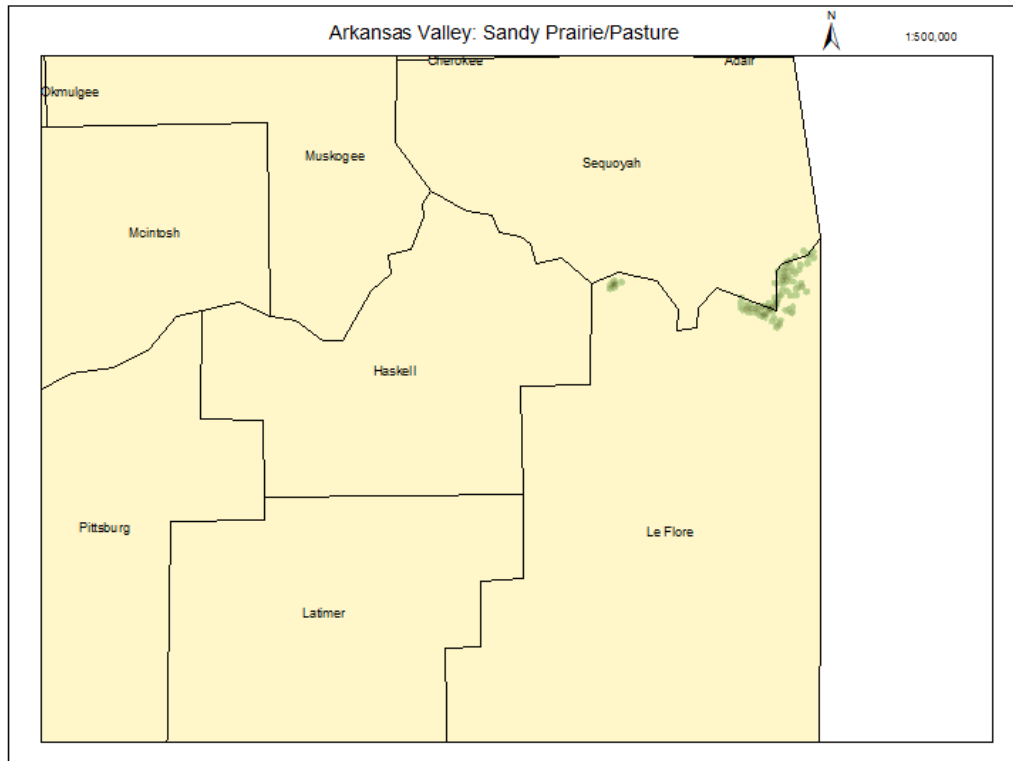
Barren

<u>Area</u>: 100,974 acres (40,862 ha)

<u>Description of Mapped Type:</u> This type consists of areas that were largely unvegetated at the time of satellite remote sensing data collection (circa 2012).

Black Mesa: Deciduous Shrubland and Woodland

Area: 13,574 acres (5,493 ha)

Description of Mapped Type: This type is represented mainly by open shrublands with skunkbush sumac, Gambel oak, mountain mahogany and Mohr's shin oak. Mesquite, one-seed juniper, and succulents such as tree cholla and soapweed yucca are common. Grama species, little bluestem, silver bluestem, and sand dropseed are common grasses.

Black Mesa: Deciduous Shrubland and Woodland   1:350,000

Cimarron

Texas
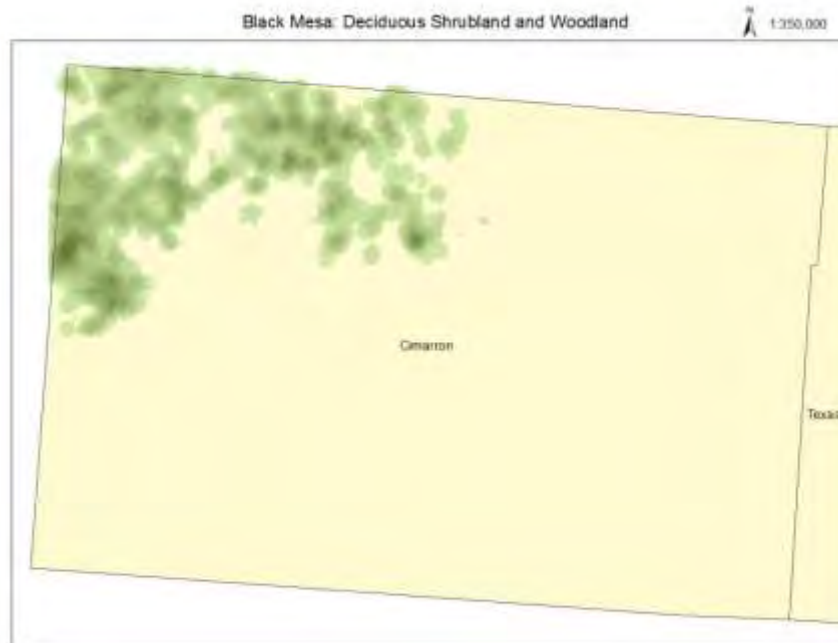
Black Mesa: Pinyon-Juniper Shrubland

Area: 21,978 acres (8,894 ha)

Description of Mapped Type: This type forms sparse woodlands or shrublands dominated by one-seed juniper and two-needle pinyon. Common shrubs include skunkbush sumac, mountain mahogany, and Gambel oak. Grasses may include sideoats, blue, and hairy grama, sand dropseed, and tobosa. Soapweed yucca and tree cholla are common succulents.

Black Mesa: Pinyon-Juniper Shrubland
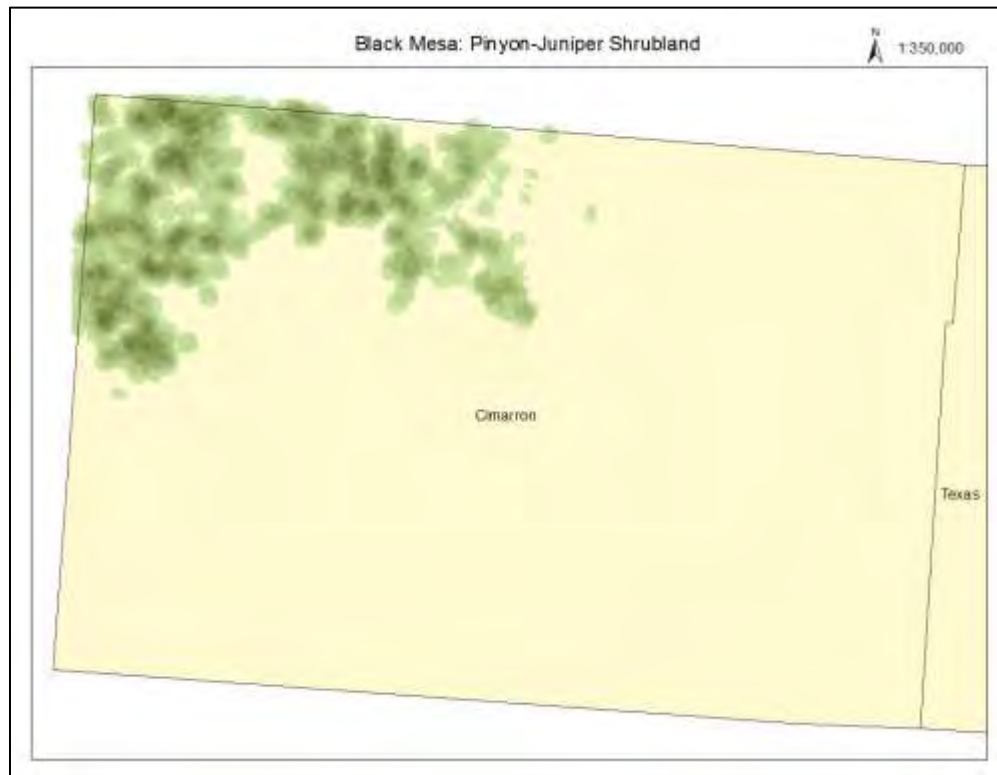
Black Mesa: Pinyon-Juniper Woodland

Area: 2,712 acres (1,097 ha)

Description of Mapped Type: This type forms fairly dense woodlands with two-needle pinyon and one-see juniper as important components.   Common shrubs include skunkbush sumac, mountain mahogany, and Gambel oak. Grasses may include sideoats, blue, and hairy grama, sand dropseed, and tobosa. Soapweed yucca and tree cholla are common succulents.
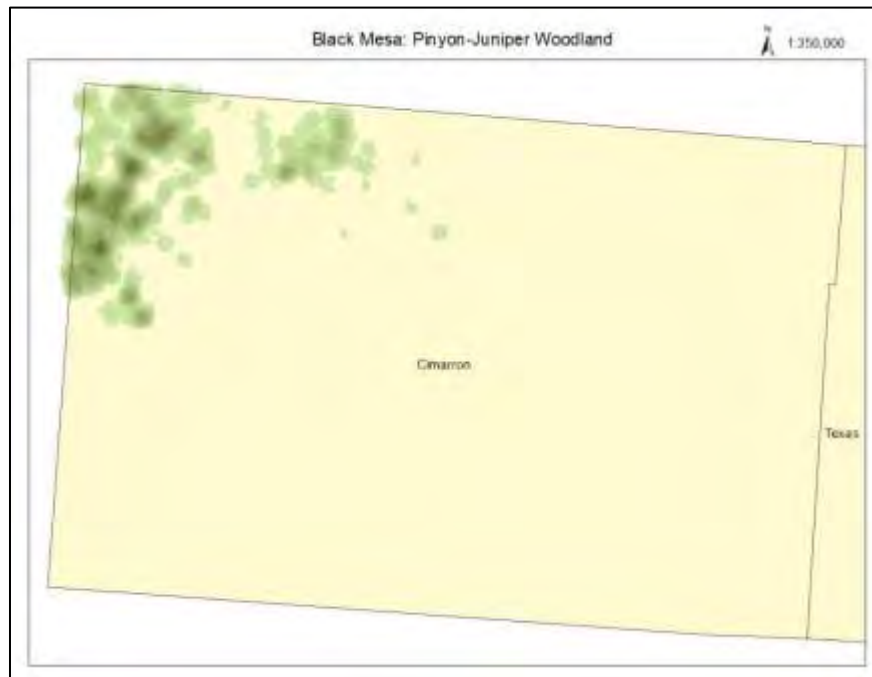
Blackland: Pasture/Prairie

Area: 8,131 acres (3,291 ha)

Description of Mapped Type: In the modern landscape this type is most often represented by heavily grazed pasture dominated by non-native and grazing tolerate species such as Bermudagrass, field brome, and tall fescue. Areas with lower levels of grazing may have species such as little bluestem, yellow Indiangrass, and big bluestem among the dominants.

Blackland: Pasture/Prairie

Canyon: Deciduous Shrubland

Area: 72,926 acres (29,512 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks that do not contain much gyp. Common shrubs include skunkbush sumac, fragrant sumac, Mohr shin oak, Chickasaw plum, lotebush, and mesquite (within range). Eastern redcedar and sandage may also be components. Short and mid-grasses such as sideoats grama, hairy grama, tobosa, sand dropseed, little bluestem, silver bluestem, and cheatgrass occur in the modern landscape. Grazing-tolerant forbs such as stiff greenthread, broom snakeweed, and prairie broomweed are common.

Canyon: Deciduous Shrubland
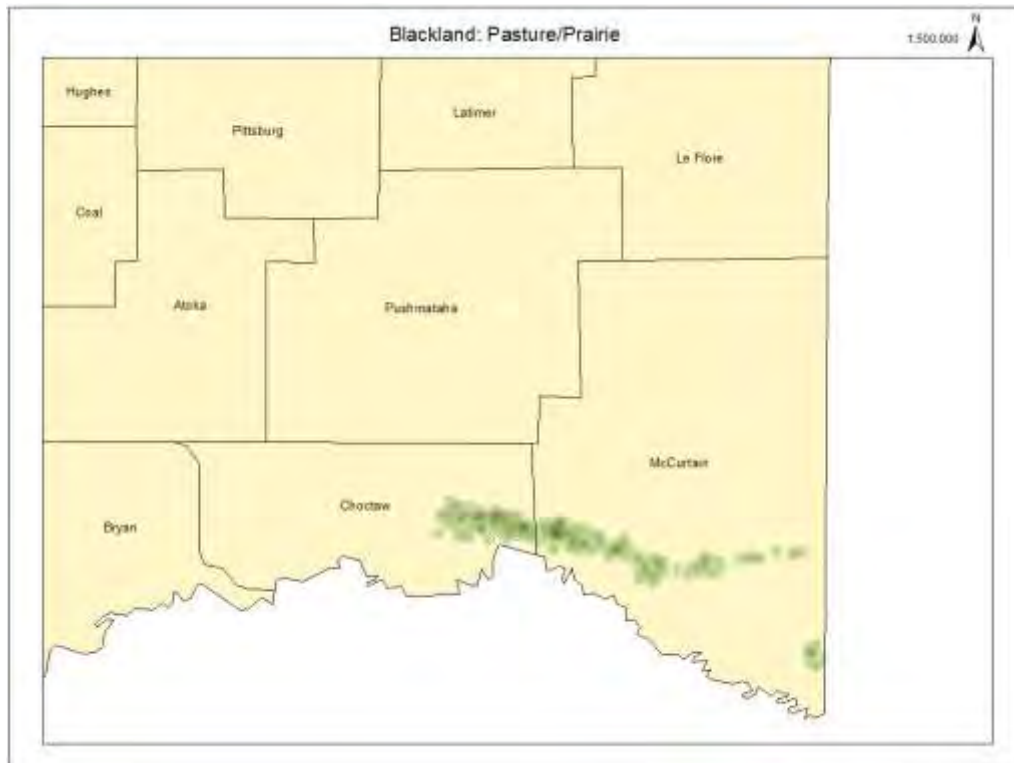
Canyon: Grassland

Area: 58,355 acres (23,615 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks that do not contain much gyp. Short and mid-grasses such as sideoats grama, hairy grama, tobosa, sand dropseed, little bluestem, silver bluestem, and cheatgrass occur in the modern landscape. Grazing-tolerant forbs such as stiff greenthread, broom snakeweed, white sagebrush, and prairie broomweed are common. Common shrubs include skunkbush sumac, Chickasaw plum, lotebush, and mesquite (within range). Eastern redcedar and sandage may also be components.

Canyon: Gyp Deciduous Shrubland

Area: 36,344 acres (14,708 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches or layers of gyp on slopes are common. Important shrubs may include skunkbush sumac, lotebush, mesquite (within range), and Mohr shin oak. Succulents such as soapweed yucca, pricklypear, and Christmas cactus may be present. Pinchot's juniper, or less commonly, eastern redcedar may be present. Short and mid-grasses such as gramas, little bluestem, cane bluestem, and annual dropseeds are also common.

Canyon: Gyp Grassland

Area: 166,496 acres (67,379 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches or layers of gyp on slopes are common. Short and mid-grasses such as sideoats grama, blue grama, hairy grama, little bluestem, cane bluestem, sand dropseed, and annual bromes are also common. Forbs common in the modern landscape include broom snakeweed, common broomweed, stiff greenthread, Navajo tea, Indian breadroot, stemmy four-nerve daisy, sundrops species, and western ragweed. Important shrubs may include skunkbush sumac, lotebush, mesquite (within range), and Mohr shin oak. Succulents such as soapweed yucca, pricklypear, and Christmas cactus may be present. Pinchot's juniper, or less commonly, eastern redcedar may be present.

Canyon: Gyp Juniper Shrubland

Area: 23,261 acres (9,414 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches or layers of gyp on slopes are common. Pinchot's juniper is the most common dominant, but eastern redcedar may be locally important. Other woody species may include sumac species, lotebush, mesquite (within range), soapberry, sugar hackberry, gum bumelia, and Siberian elm. Short and mid-grasses such as gramas, little bluestem, cane bluestem, and annual dropseeds are important, along with forbs such as broom snakeweed and common broomweed.

Canyon: Gyp Mesquite Shrubland

Area: 17,754 acres (7,185 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches of gyp are common. This type is mapped both low on the landscape on canyon bottoms as well as on broken uplands, plateaus, and ridges. Mesquite is the most common dominant, and species such as lotebush, Pinchot's juniper, eastern redcedar, soapberry, and sugar hackberry may be present. This type may be more or less open, with elements of the Canyon: Gyp Grassland common.
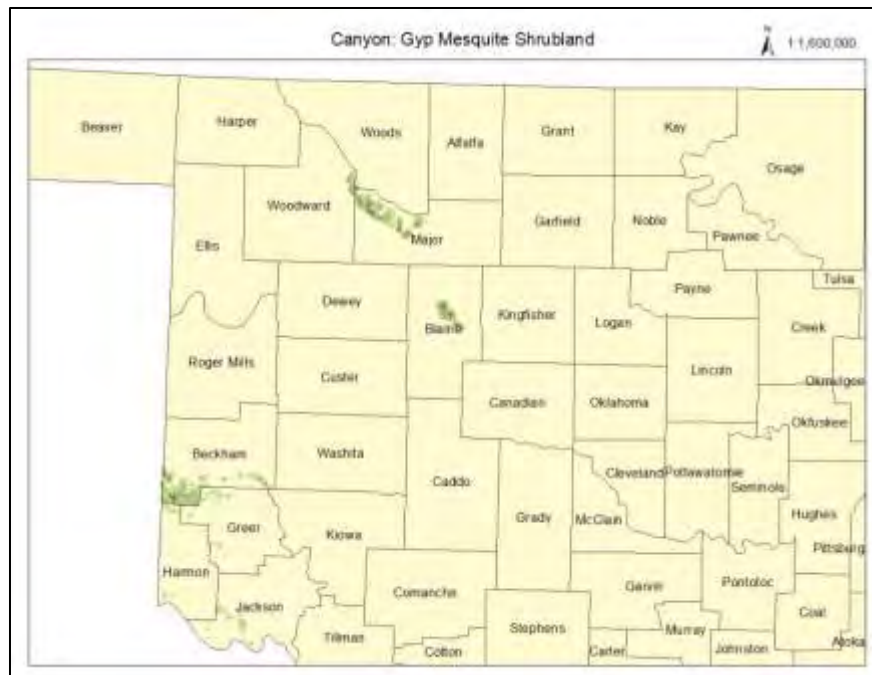
Canyon: Gyp Sparsely Vegetated

Area: 521 acres (211 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches of open gyp with bare rock or bare ground or sparse vegetation occur over fairly extensive areas (>1000 sq m). Herbaceous and shrubby elements of other Canyon: Gyp types may be present.
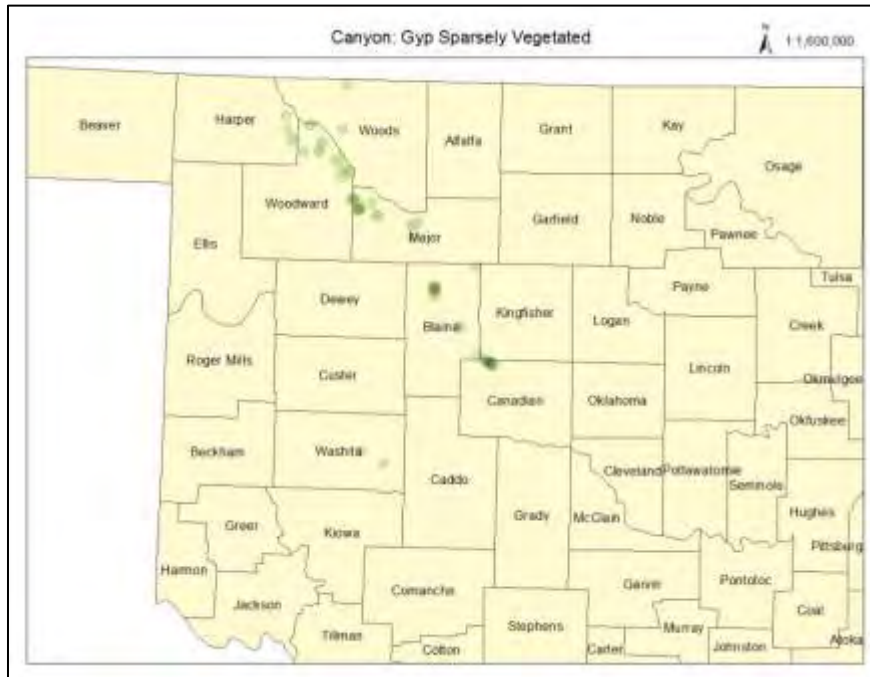
Canyon: Juniper Shrubland

Area: 55,497 acres (22,459 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks that do not contain much gyp. Eastern redcedar is the most common dominant, but Pinchot's juniper may also be dominant. Other important woody species may include skunkbush sumac, fragrant sumac, Mohr shin oak, Chickasaw plum, lotebush, Siberian elm, sugar hackberry, and mesquite (within range). Eastern redcedar and sandage may also be components. Short and mid-grasses such as sideoats grama, hairy grama, tobosa, sand dropseed, little bluestem, silver bluestem, and cheatgrass occur in the modern landscape. Grazing-tolerant forbs such as stiff greenthread, broom snakeweed, and prairie broomweed are common.

Canyon: Juniper Shrubland

Canyon: Sparsely Vegetated

Area: 116 acres (47 ha)

Description of Mapped Type: This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches of open bare ground or very open vegetation occur over fairly extensive areas (>1000 sq m). Herbaceous and shrubby elements of other Canyon types may be present.

Central Mixedgrass: Prairie/Pasture

Area: 5,343,649 acres (2,162,501 ha)

Description of Mapped Type: This type circumscribes a variety of grasslands in different conditions across broad gradients in both moisture and temperature. In the modern landscape, non-native and grazing-tolerant species such as field brome, Bermudagrass, prairie broomweed, cheatgrass, three-awn species, hairy grama, other grama species, buffalograss, and western ragweed are common. Species such as little bluestem, silver bluestem, and sideoats grama may be more important in less heavily grazed areas, especially to the east within this type. Woody components may include mesquite (south), eastern redcedar, Osage orange, and honeylocust.
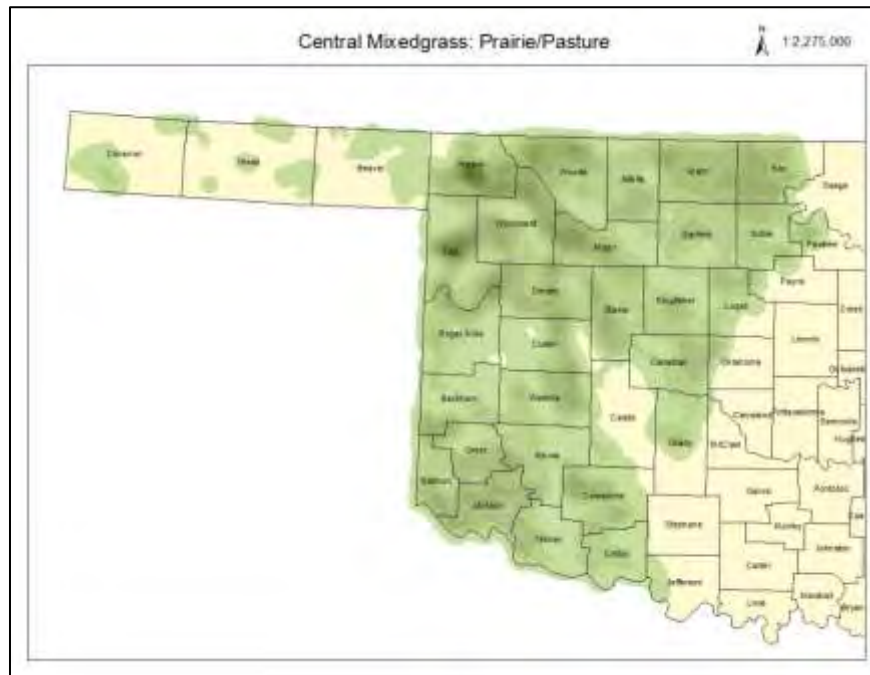
Central Mixedgrass: Sandy Prairie/Pasture

Area: 349,321 acres (141,365 ha)

Description of Mapped Type: In the modern landscape, this type is mainly represented by grazed pastures with species such as cheatgrass, western ragweed, sand dropseed, field brome, King Ranch bluestem, and Bermudagrass common. Areas with less grazing pressure have species such as little bluestem, sideoats grama, silver bluestem, blue grama, and big bluestem. Other common species include snake broomweed, prairie broom weed, white sagebrush, and soapweed yucca. Eastern redcedar, honey mesquite (within range), sand sagebrush, and Chickasaw plum may be present.

Central Mixedgrass: Sandy Prairie/Pasture
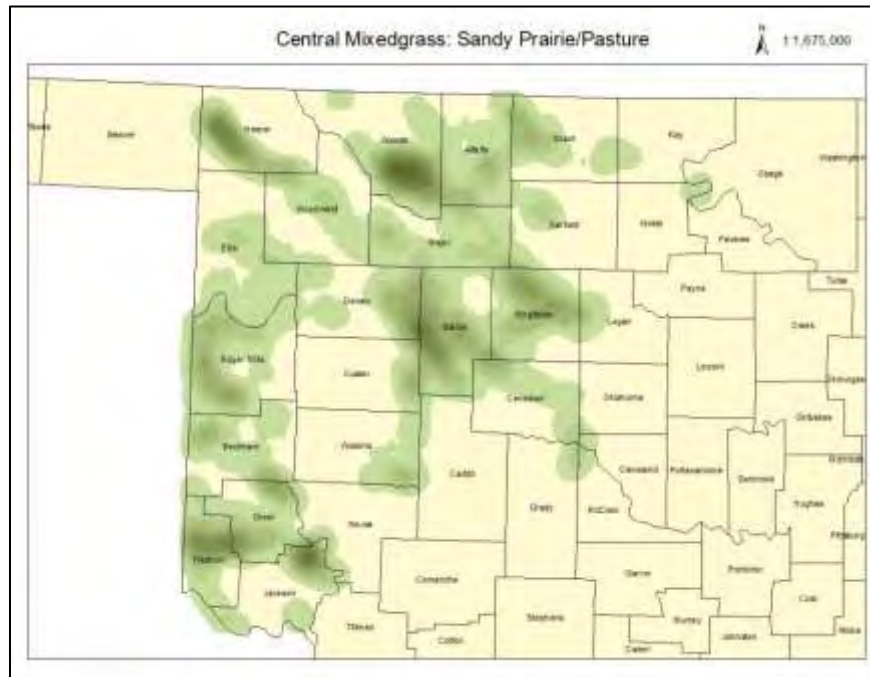
Crosstimbers: Eastern Redcedar Slope Woodland and Shrubland

Area: 9,122 acres (3,692 ha)

Description of Mapped Type: This type is mapped on slopes >20%, and composition is similar to the Crosstimbers: Eastern Redcedar Woodland and Shrubland type, although it is commonly dominated by taller trees rather than shrubs, and canopy closure tends to be higher. Common associated trees include post oak, blackjack oak, sugar hackberry, gum bumelia, winged elm, and black hickory.

Crosstimbers: Eastern Redcedar Slope Woodland and Shrubland

Crosstimbers: Eastern Redcedar Woodland and Shrubland

Area: 86,916 acres (35,174 ha)

Description of Mapped Type: This type circumscribes young, sparse woodlands and shrublands as well as more dense woodlands where eastern redcedar is a significant component. Other important woody species may include post oak, blackjack oak, hackberry species, gum bumelia, winged elm, and black hickory.
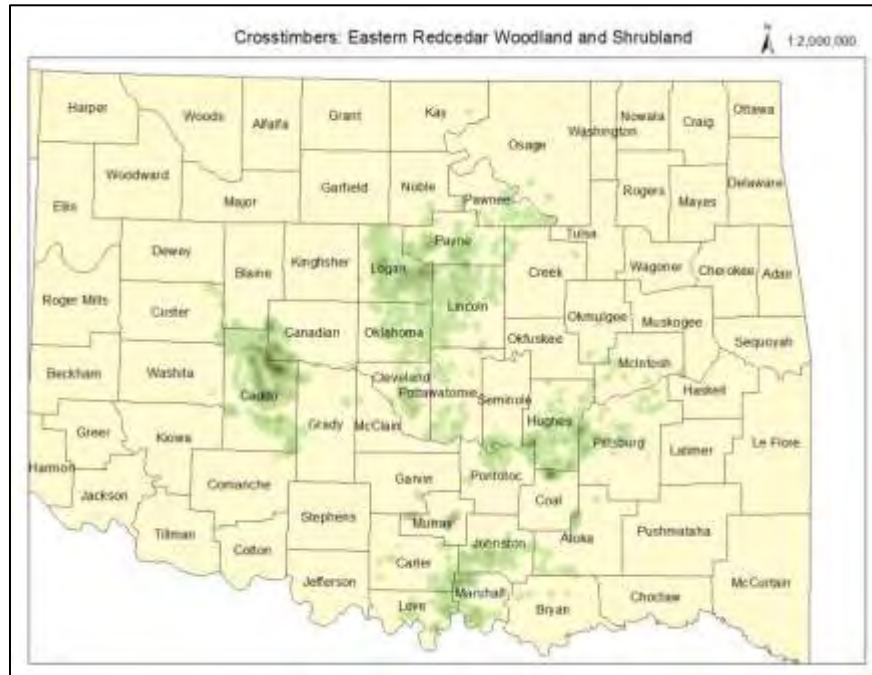
Crosstimbers: Pasture/Prairie

Area: 6,173,191 acres (2,498,205 ha)

Description of Mapped Type: This type is mapped essentially from the southern border to the northern border of Oklahoma, and across the east to west extent of the Crosstimbers and transition zone to central Oklahoma. In the modern landscape, non-native and grazing-tolerant species dominate most areas. Common species include Bermudagrass, field brome, western (Cuman) ragweed, and tall fescue. More lightly-grazed areas or hay meadows may have species such as little bluestem, silver bluestem, switchgrass, big bluestem, sideoats grama, and yellow Indiangrass. Woody species such as post oak, pecan, blackjack oak, winged elm, eastern redcedar, honeylocust, Osage orange, and common persimmon may be components.

Crosstimbers: Post Oak – Blackjack Oak Forest and Woodland

<u>Area</u>: 2,559,536 acres (1,035,809 ha)

<u>Description of Mapped Type:</u> This type is mapped on typical woodland soils across a wide swath of central Oklahoma. Woodland quality and successional state varies within the type. Common dominants include post oak, blackjack oak, black hickory, black oak, winged elm, pecan, and Shumard oak. Eastern redcedar is a common component. Understory species may include coralberry, eastern redbud, rough dogwood, common persimmon, and gum bumelia.

Crosstimbers: Post Oak - Blackjack Oak Slope Forest

Area: 155,528 acres (62,940 ha)

Description of Mapped Type: This type is mapped on slopes >20% and composition is similar to Crosstimbers: Post Oak – Blackjack Oak Forest, although these stands tend to have more canopy and more often contain older trees. Common components include post oak, blackjack oak, black hickory, green ash, winged elm, redbud, and rough dogwood.

Crosstimbers: Post Oak - Eastern Redcedar Forest and Woodland

Area: 28,162 acres (11,397 ha)

Description of Mapped Type: This type is mapped on typical woodland soils across a wide swath of central Oklahoma. Woodland quality and successional state varies within the type, but eastern redcedar is among the dominants. Other common species may include post oak, blackjack oak, black hickory, black oak, winged elm, pecan, and Shumard oak. Understory species may include coralberry, eastern redbud, rough dogwood, Osage orange, and gum bumelia.
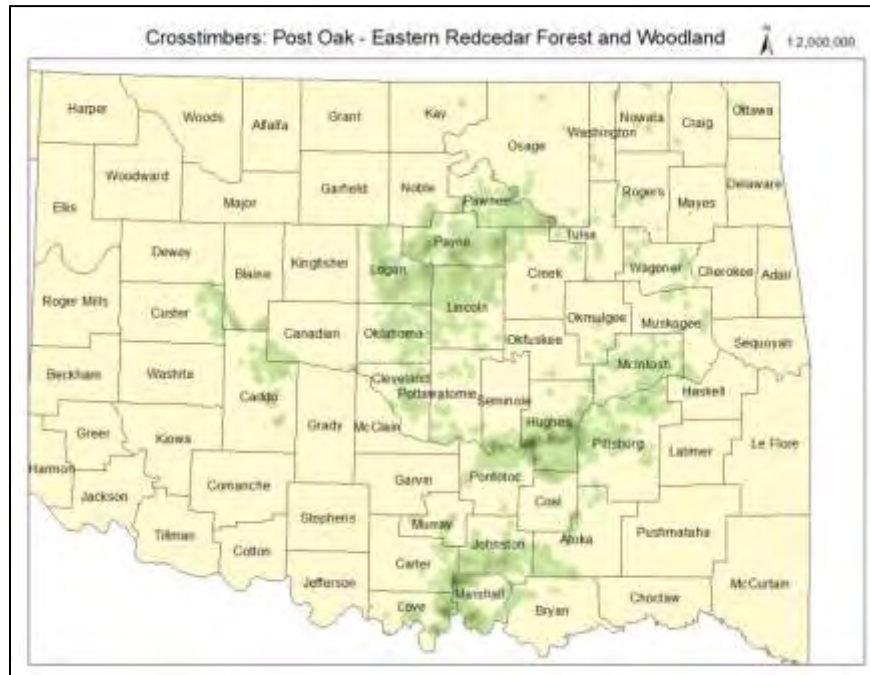
Crosstimbers: Post Oak - Eastern Redcedar Slope Forest

Area: 3,696 acres (1,496 ha)

Description of Mapped Type: This type is mapped on slopes >20%, and is similar to the Crosstimbers: Post Oak - Eastern Redcedar Forest type, although stands tend to have more canopy cover. Eastern redcedar is an important component, together with species such as post oak, black hickory, blackjack oak, redbud, gum bumelia, green ash, winged elm, and rough dogwood.
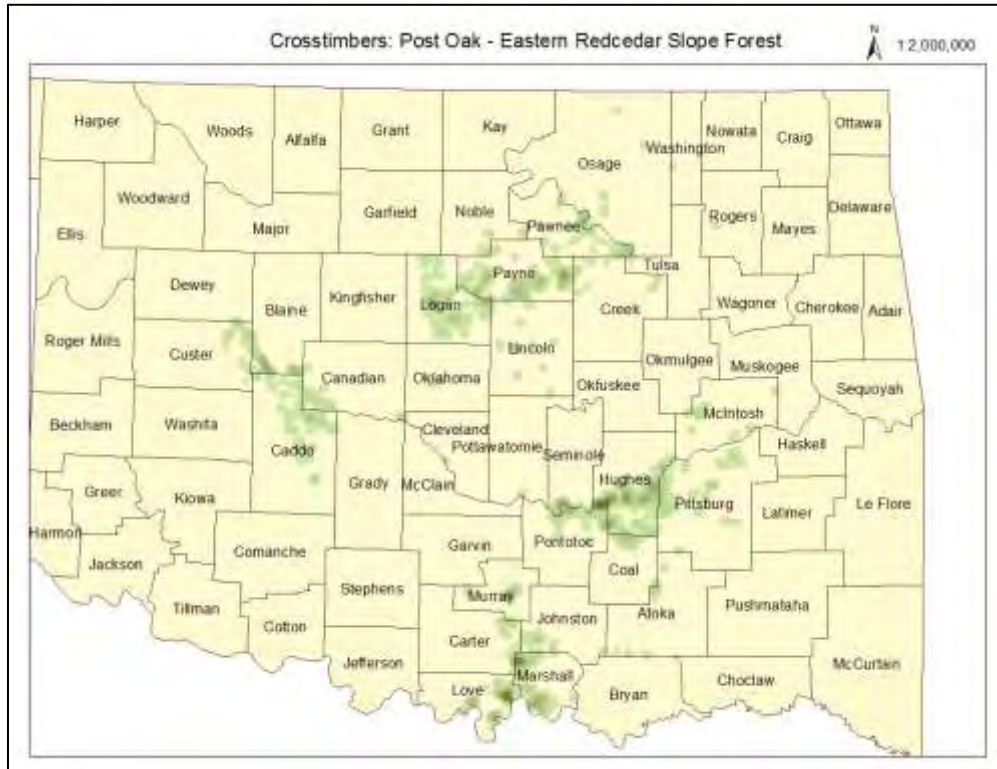
Crosstimbers Sandyland Post Oak – Blackjack Oak Forest and Woodland

Area: 173,865 acres (70,361 ha)

Description of Mapped Type: This type is mapped over more or less deep, wind- or water-deposited sands. Common trees include post oak, blackjack oak, black hickory, sugar hackberry, and pecan. Open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.
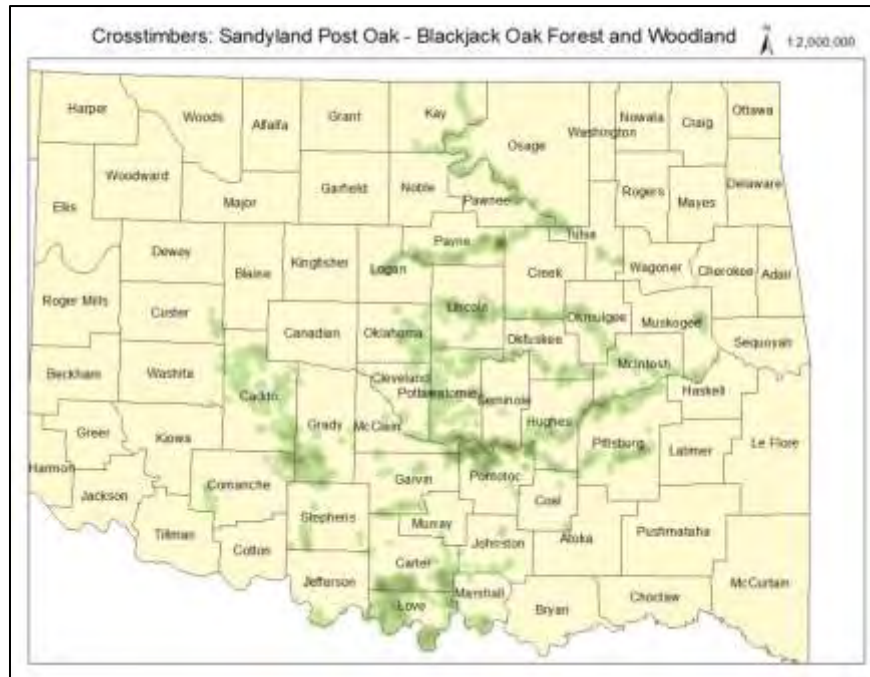
Crosstimbers: Sandyland Shrubland and Grassland

Area: 412,499 acres (166,933 ha)

Description of Mapped Type: This type is mapped over more or less deep sands and in the modern landscape if most often represented by grazed pasture with non-native and grazing-tolerant species such as Bermudagrass, tall fescue, annual ragweed, weeping lovegrass, Johnsongrass, and sandbur species. Overall herbaceous species diversity tends to be fairly high over deeper sand, and some may contain species such as little bluestem, pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack. Common woody components include Chickasaw plum, post oak, winged elm, and blackjack oak.
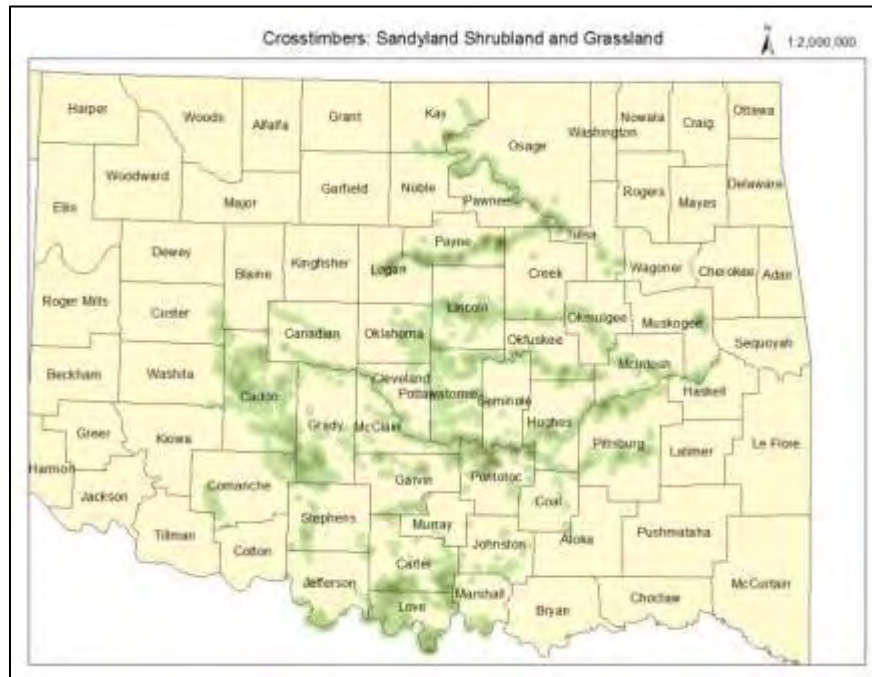
Crosstimbers: Young Post Oak – Blackjack Oak Woodland

Area: 177,178 acres (71,702 ha)

Description of Mapped Type: This type represents pastures and woodland edges with sparse successional vegetation, including shrubs and trees. Common woody species include blackjack oak, post oak, winged elm, sumac species, hackberry species, common persimmon, honeylocust, gum bumelia, and pecan. Herbaceous areas have species such as Bermudagrass, field brome, tall fescue, purpletop tridens, little bluestem, and silver bluestem. Vines such as eastern poison ivy and greenbriar species are common.

Disturbed Soil Pasture

Area: 61,451 acres (24,868 ha)

Description of Mapped Type: This type is mapped over soils defined as disturbed by digital soil surveys (e.g. slickspots, pits). Non-native and disturbance species such as Bermudagrass, tall fescue, Johnsongrass, winged elm, and honeylocust are common components.

Eastern Great Plains: Herbaceous Wetland

Area: 30,651 acres (12,404 ha)

Description of Mapped Type: This type circumscribes all varieties of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.

Eastern Great Plains: Herbaceous Wetland
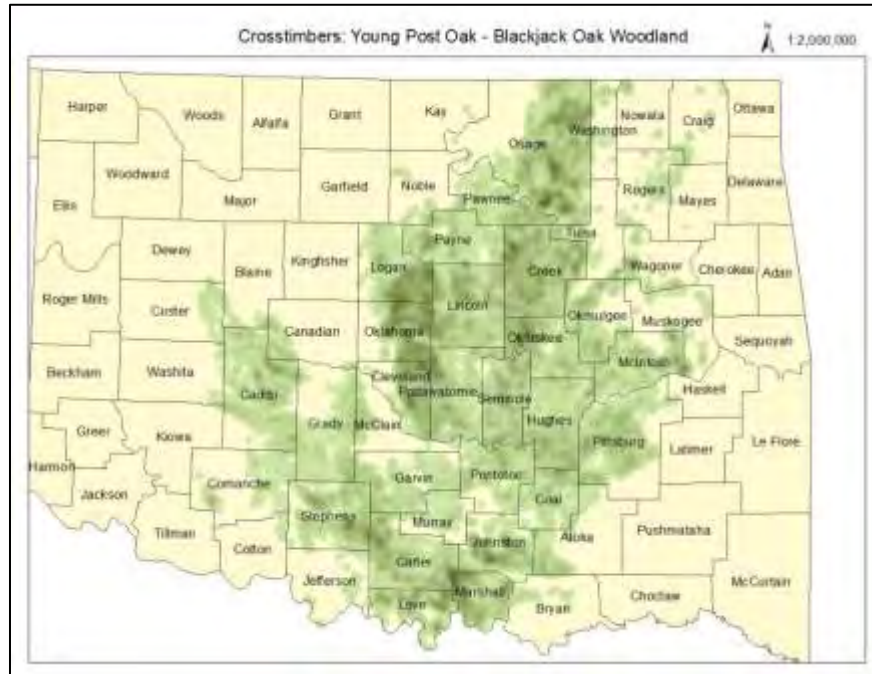
Flint Hills: Tallgrass Prairie/Pasture

Area: 541,124 acres (218,986 ha)

Description of Mapped Type: This type occurs mainly over unbroken sod in grazed pastures in the modern landscape, but some native hay meadows are also present. Common grazing-tolerant species include field brome, tall fescue, silver bluestem, prairie broomweed, and western (Cuman) ragweed. Tallgrass prairie elements may include little bluestem, big bluestem, switchgrass, heath aster, leadplant, Canada goldenrod, and gayfeather species. Woody plants such as eastern redcedar, honeylocust, pecan, common persimmon, and Chickasaw plum may be present.
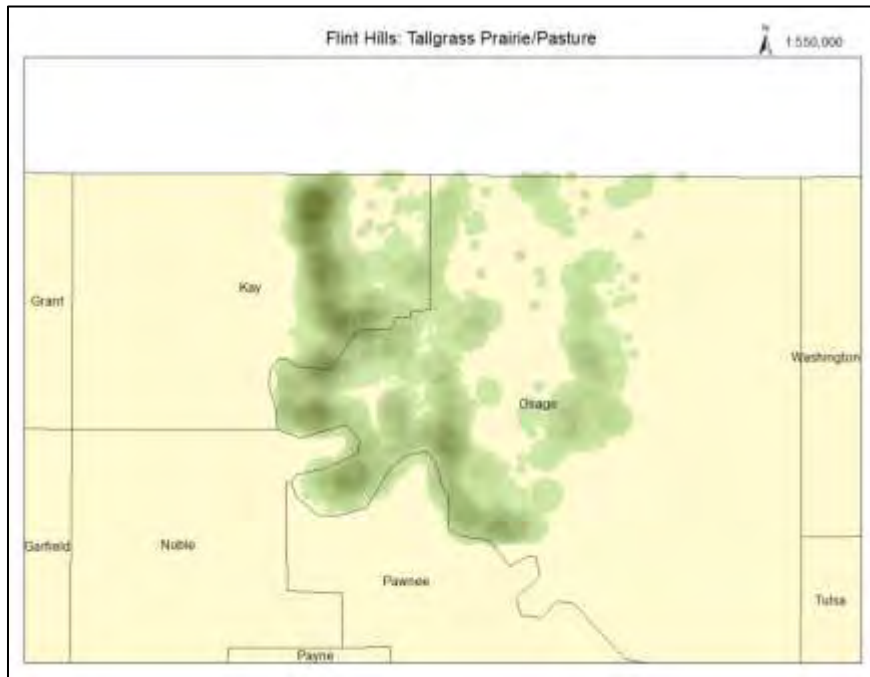
Grand Prairie: Prairie/Pasture

Area: 42,322 acres (17,127 ha)

Description of Mapped Type: This type is mainly grazed or improved pasture in the modern landscape, with species such as Bermudagrass, prairie broomweed, field brome, King Ranch bluestem, silver bluestem, western (Cuman) ragweed, and Johnsongrass common. Woody species such as winged elm, Chickasaw plum, and honeylocust may be present.
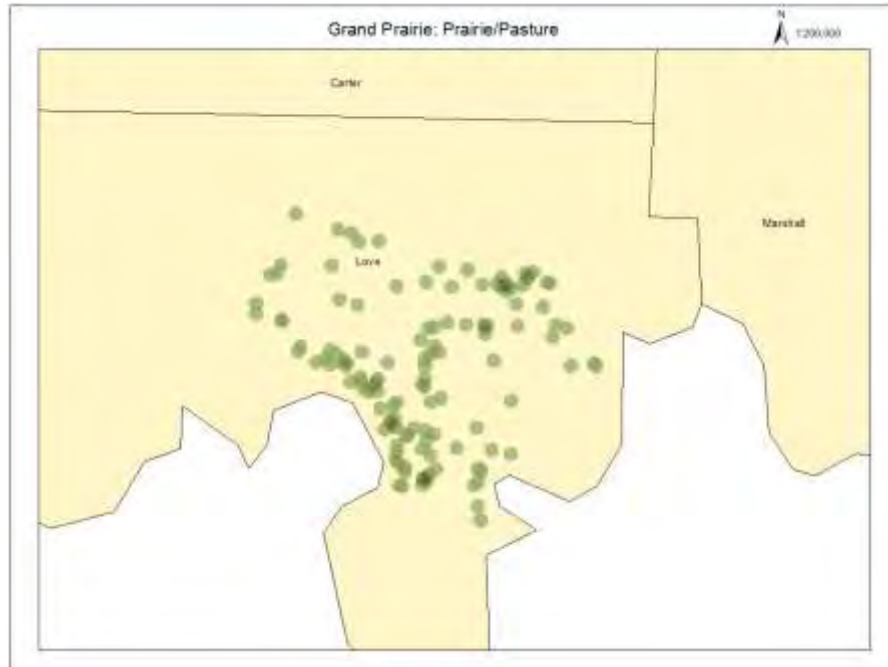
High Plains: Active Sand Dunes

<u>Area</u>: 1,952 acres (790 ha)

<u>Description of Mapped Type:</u> This type consists of bare dunes with little vegetation.

High Plains: Bottomland Barrens

Area: 19,499 acres (7,891 ha)

Description of Mapped Type: This type consists of areas that were largely unvegetated at the time of data collection, including sand bars, mud flats, and bare rock in bottoms.

High Plains: Bottomland Barrens

High Plains: Bottomland Deciduous Shrubland

Area: 133,430 acres (53,997 ha)

Description of Mapped Type: This type is mainly represented by successional shrublands or young woodlands in the modern landscape. Species such as black willow, Chickasaw plum, winged elm, western soapberry, plains cottonwood, green ash, honeylocust, Siberian elm, other willow species, and other elm species may be present.

High Plains: Bottomland Eastern Redcedar Woodland and Shrubland

Area: 4,680 acres (1,894 ha)

Description of Mapped Type: This type consists of areas where eastern redcedar is the prevailing dominant. Other components may include winged elm, western soapberry, hackberry species, green ash, willow species, and other elm species.
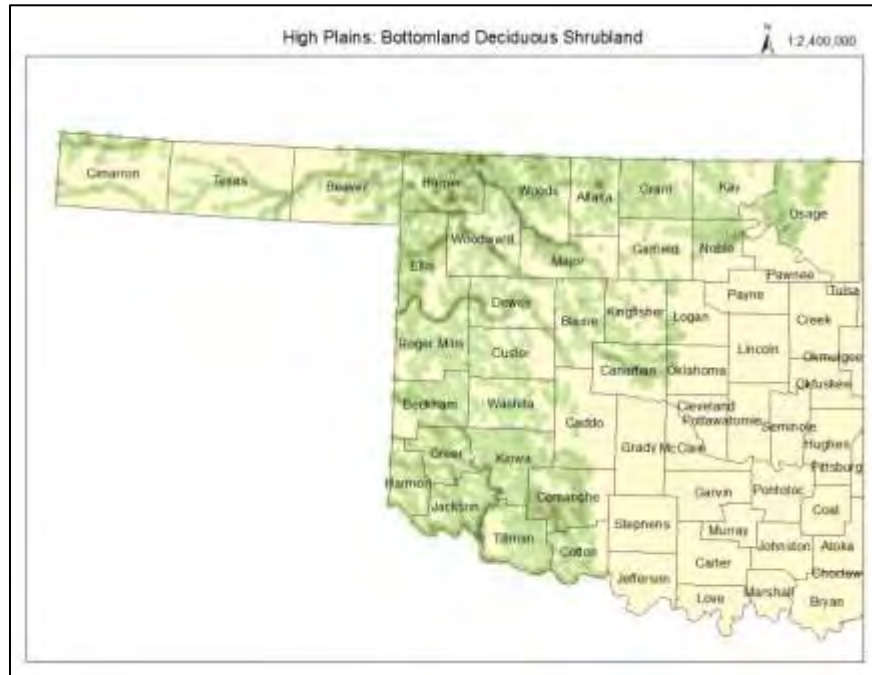
High Plains: Bottomland Hardwood – Eastern Redcedar Forest

Area: 341 acres (138 ha)

Description of Mapped Type: This type is represented by stands where eastern redcedar is among the most important species. Other components may include winged elm, western soapberry, hackberry species, green ash, honeylocust, Siberian elm, willow species, and other elm species.

High Plains: Bottomland Hardwood - Eastern Redcedar Forest

High Plains: Bottomland Hardwood Forest

Area: 453,856acres (183,669 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Typical canopy trees include plains cottonwood, bur oak, western soapberry, boxelder, American elm, green ash, honeylocust, Siberian elm, and pecan.
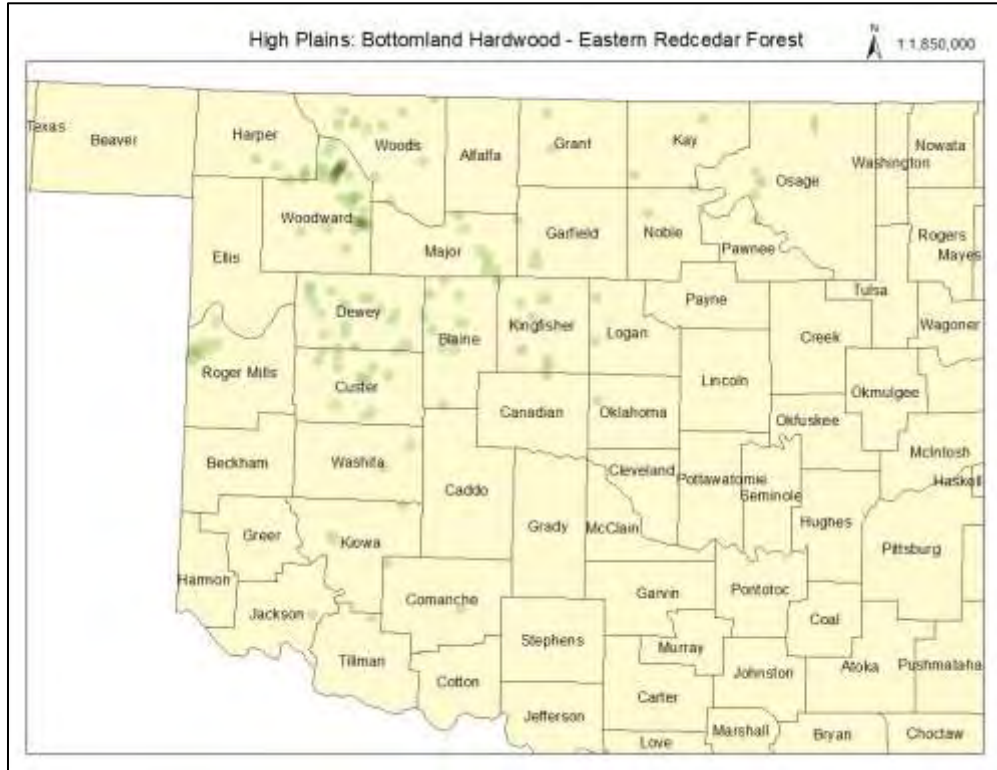
High Plains: Bottomland Herbaceous Wetland

Area: 121,055 acres (48,990 ha)

Description of Mapped: This type in the modern landscape consists primarily of grazed pastures dominated by non-native or grazing-tolerant species. Typical components include field brome, Bermudagrass, prairie broomweed, western ragweed, cheatgrass, little barley, silver bluestem, grama species, buffalograss, and little bluestem.
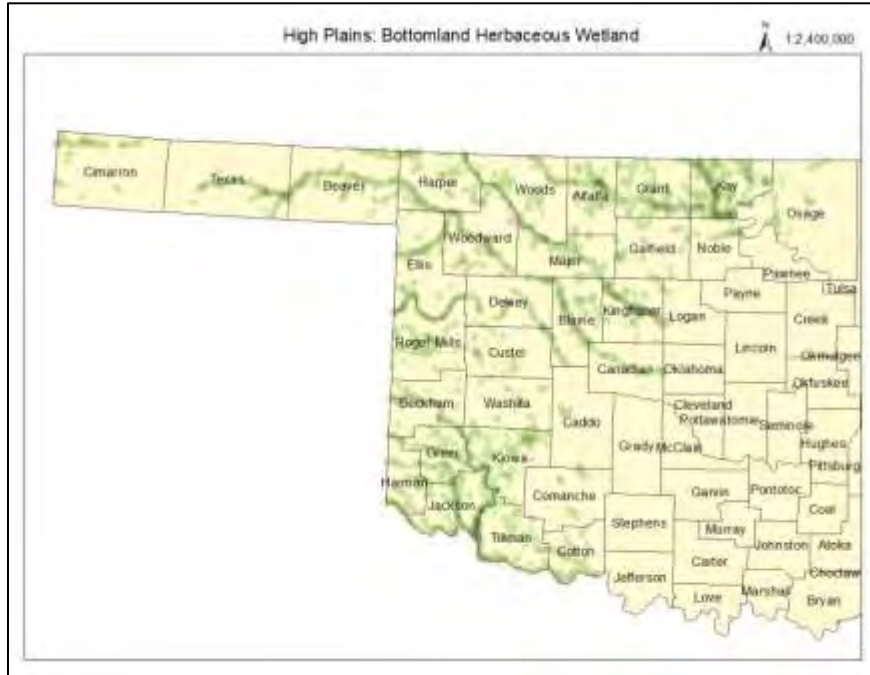
High Plains: Canyon Deciduous Shrubland

Area: 402 acres (163 ha)

Description of Mapped Type: This rare type was mapped mainly in canyons of Black Mesa in highly dissected landscapes. Important woody species may include fragrant sumac, common hoptree, mountain mahogany, and one-seed juniper. Grama species, sand dropseed, and James' galleta may occur in the herbaceous layer. Soapweed yucca is a common succulent.

High Plains: Canyon Deciduous Shrubland   1:180,000

Cimarron
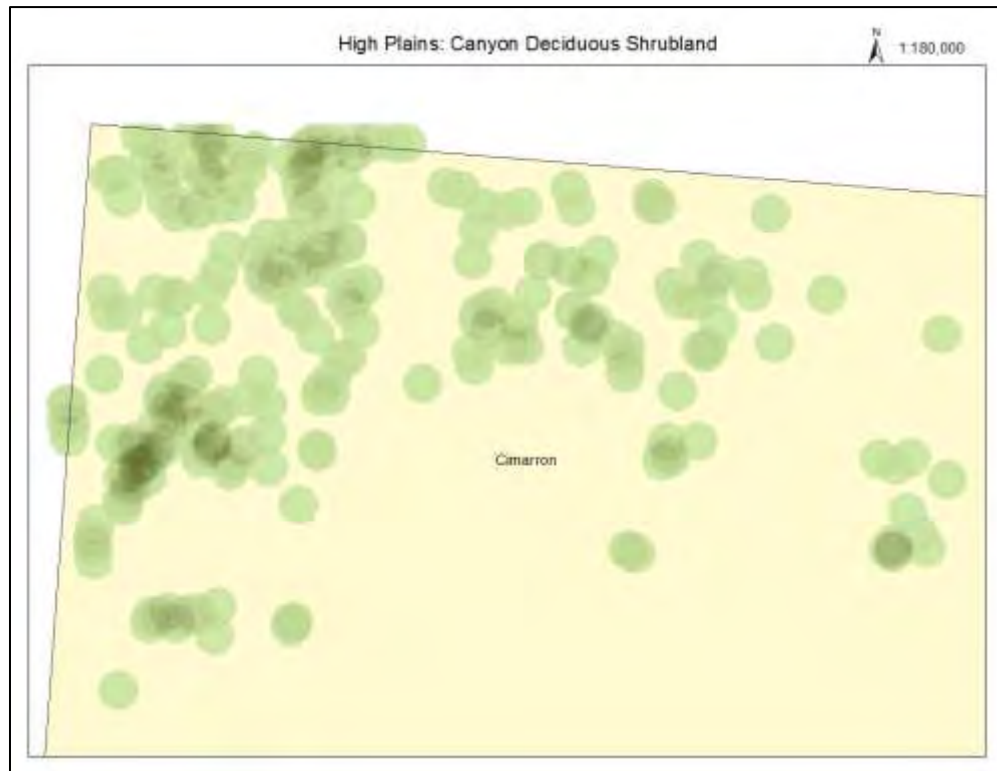
High Plains: Canyon Sparsely Vegetated

Area: 43 acres (17 ha)

Description of Mapped Type: This rare type was mapped in canyons of Black Mesa that were barren or sparsely vegetation, and is represented by bare slopes and rock outcrops.
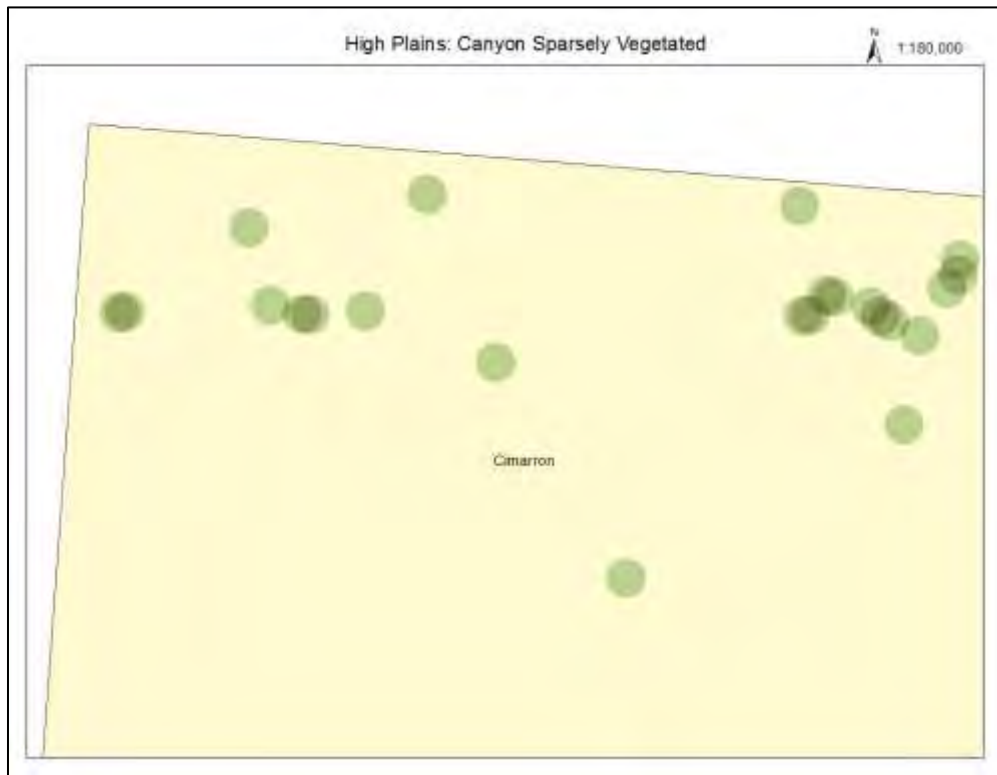
High Plains: Deep Sand Woodland

Area: 32,734 acres (13,247 ha)

Description of Mapped Type: This type is mapped over aeolian and alluvial deep sands. These woodlands may have species such as western soapberry, netleaf hackberry, and American elm. Especially near drainages, eastern cottonwood may be conspicuous. Some sites may contain non-natives such as Siberian elm and black locust.
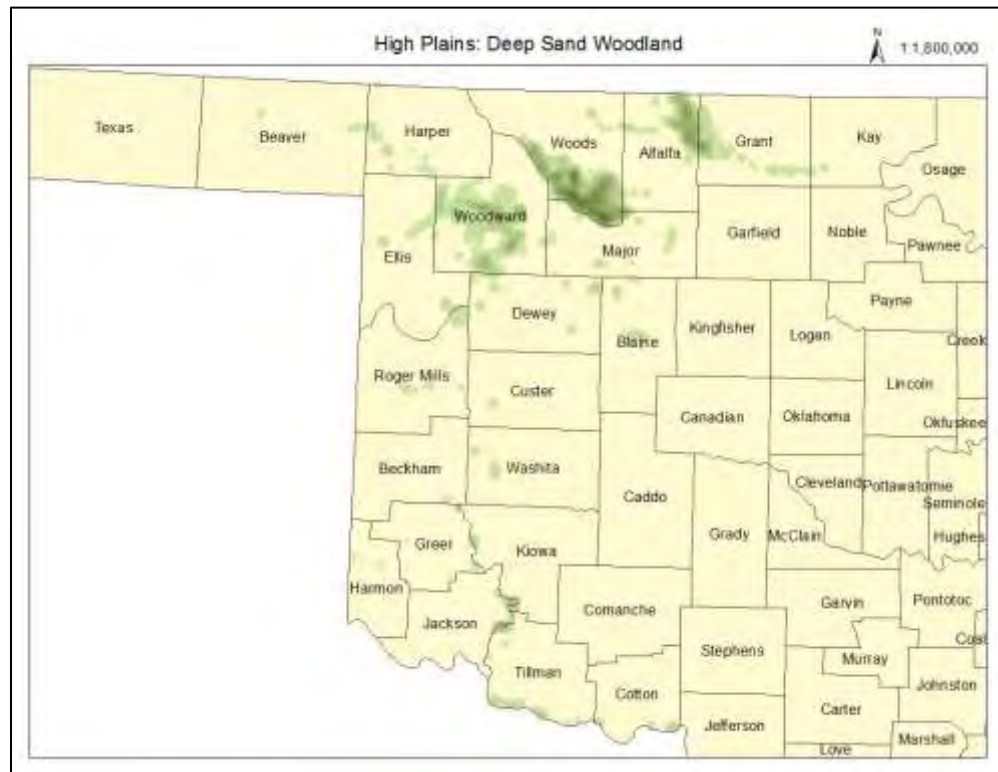
High Plains: Depression Herbaceous Wetland

Area: 1,697 acres (687 ha)

Description of Mapped Type: This type represents emergent marsh. Common species may include American bulrush, Torrey's rush, pale spikerush, flatsedges, cattails, and smartweeds.
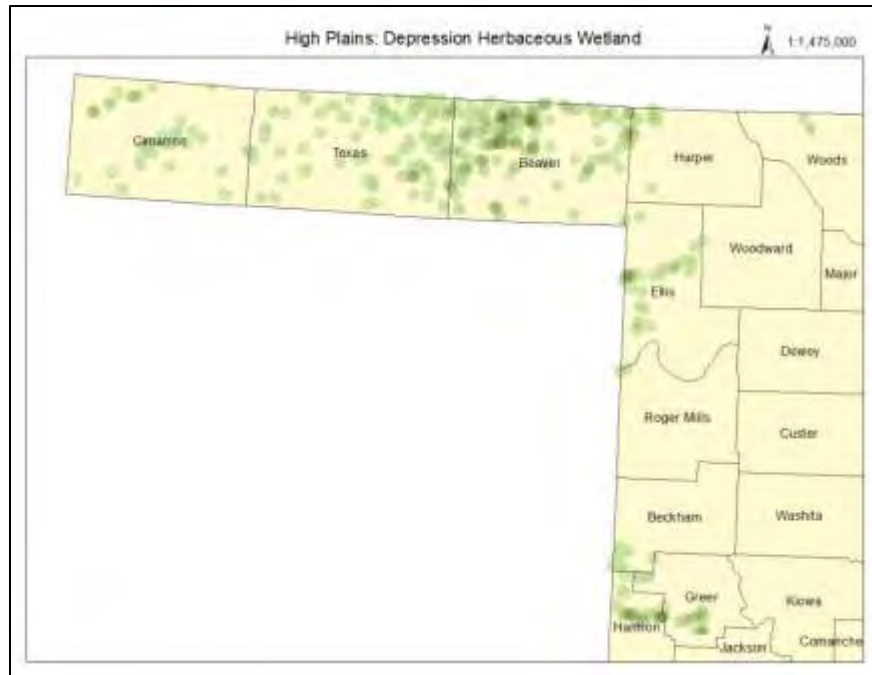
High Plains: Mesquite Shrubland

Area: 40,303 acres (16,310 ha)

Description of Mapped Type: This type is mapped over bottomland soils and is characterized by open to relatively dense stands of mesquite in grazed grasslands. Common components in the modern landscape include field brome, cheatgrass, prairie broomweed, annual ragweed, silver bluestem, sideoats grama, blue grama, other grama species, buffalograss, plains pricklypear, and little bluestem.
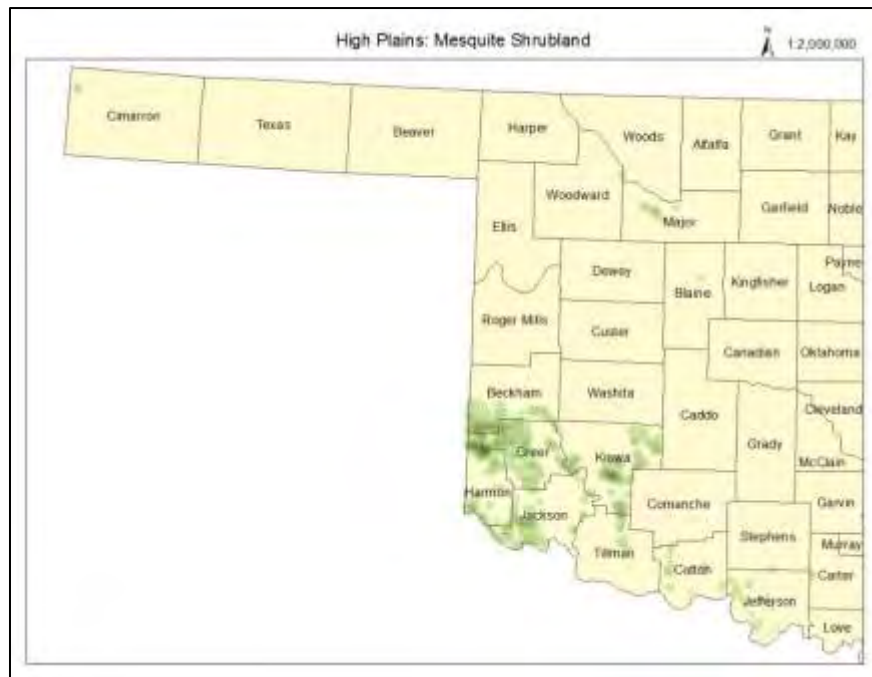
High Plains: Playa Grassland

Area: 3,114 acres (1,260 ha)

Description of Mapped Type: Playas are closed, internally drained basins, mainly associated with the High Plains. Vegetation varies over time with moisture. Common dominant grasses may include buffalograss, western wheatgrass, and vine mesquite. Other grasses may include tumblegrass, foxtail barley, and annual rabbitsfoot grass. Important herbaceous species may include povertyweed, annual saltmarsh aster, and narrowleaf goosefoot.

High Plains: Playa Marsh

Area: 1,074 acres (435 ha)

Description of Mapped Type: Playas are closed, internally drained basins, mainly associated with the High Plains. Vegetation varies over time with moisture. Common species may include pale spikerush, hairy waterclover, flatsedges, knotweeds, wedgeleaf, and cattails.

High Plains: Riparian Barrens

Area: 3,028 acres (1,225 ha)

Description of Mapped Type: These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent stream scours, dry stream beds, and exposed rock.

High Plains: Riparian Barrens
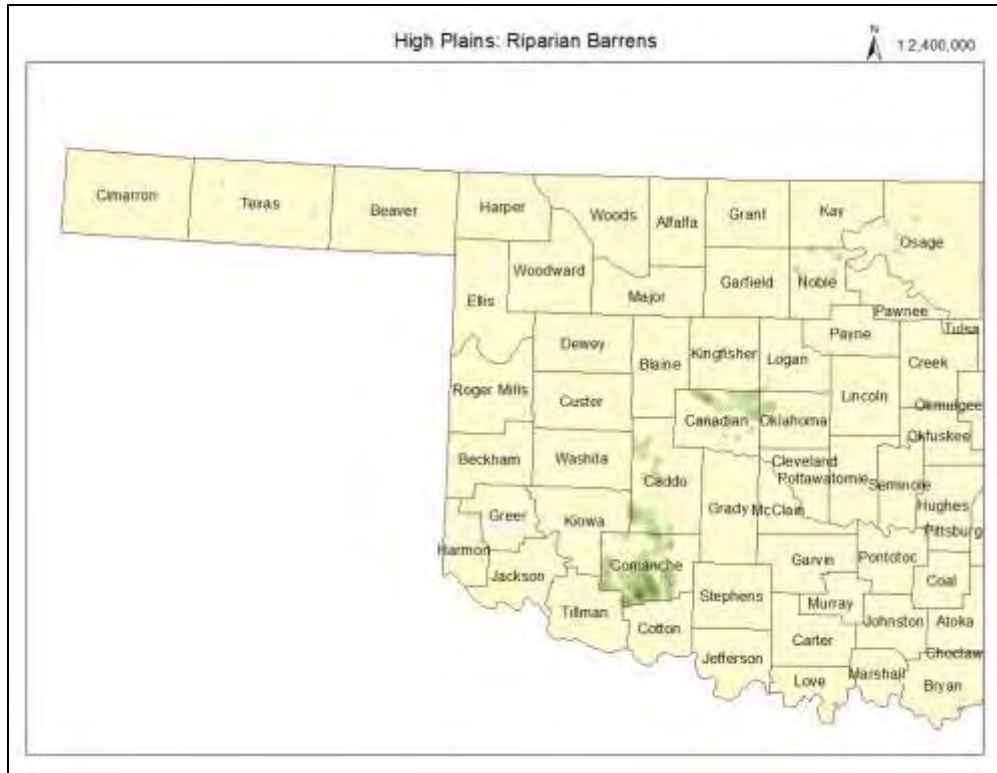
High Plains: Riparian Deciduous Shrubland

Area: 74,583 acres (30,183 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. This type may represent slightly moister or much wetter types than the surrounding uplands. Common species include willow species, winged elm, honeylocust, western soapberry, sugar hackberry, ash species, and elm species.

High Plains: Riparian Eastern Redcedar Woodland and Shrubland

Area: 11,564 acres (4,680 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and consists of areas where eastern redcedar is the prevailing dominant. Other components may include winged elm, western soapberry, hackberry species, green ash, willow species, and elm species.
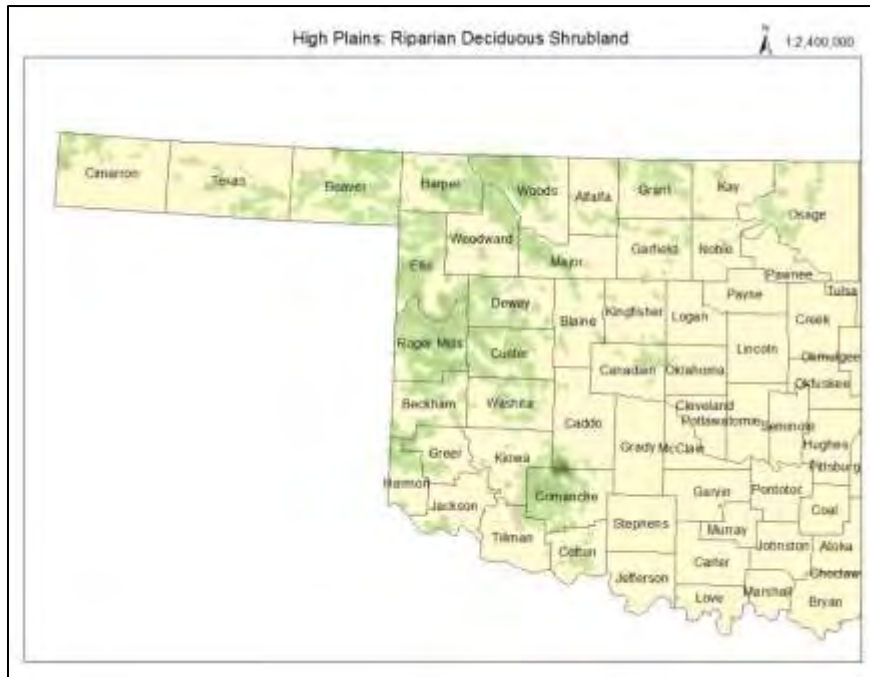
High Plains: Riparian Hardwood Woodland

Area: 212,963 acres (86,183 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. A wide variety of canopy trees may be important, including plains cottonwood, bur oak, sycamore, western soapberry, Siberian elm, sugar hackberry, willow species, boxelder, elm species, gum bumelia, ash species, and honeylocust.

High Plains: Riparian Herbaceous Wetland

Area: 3,401 acres (1,376 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.

High Plains: Riparian Herbaceous Wetland

High Plains: Riparian Mixed Hardwood – Eastern Redcedar Woodland

Area: 9,761 acres (3,950 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by stands where eastern redcedar is among the most important species. Other components may include winged elm, western soapberry, hackberry species, green ash, honeylocust, Siberian elm, American elm, and willow species.

High Plains: Saline Flat

Area: 14,258 acres (5,770 ha)

Description of Mapped Type: This type is mapped in moist flats, often over soils derived from gypsum outcrops upstream or upslope. These areas were mainly barren at the time of data collection for this project.
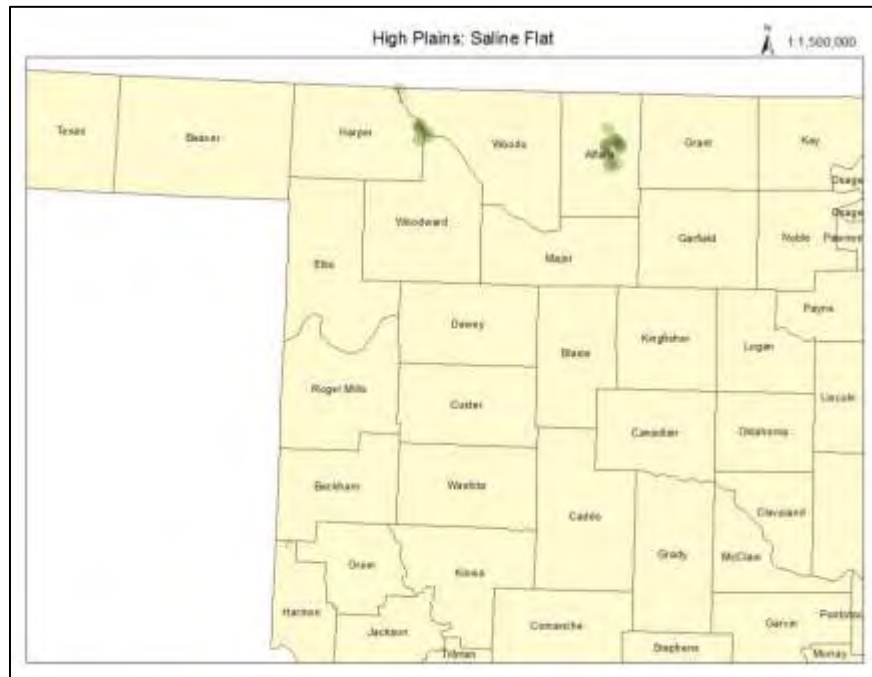
High Plains: Salt Lake Shrubland

Area: 4,064 acres (1,644 ha)

Description of Mapped Type: This type is mapped on moist flats with soils often derived from gypsum upstream or upslope. Common shrubs in the modern landscape include saltcedar species, willow baccharis, and mesquite (within range). Herbaceous species similar to those described for the High Plains: Salty Grassland may be interspersed within this generally open shrubland.
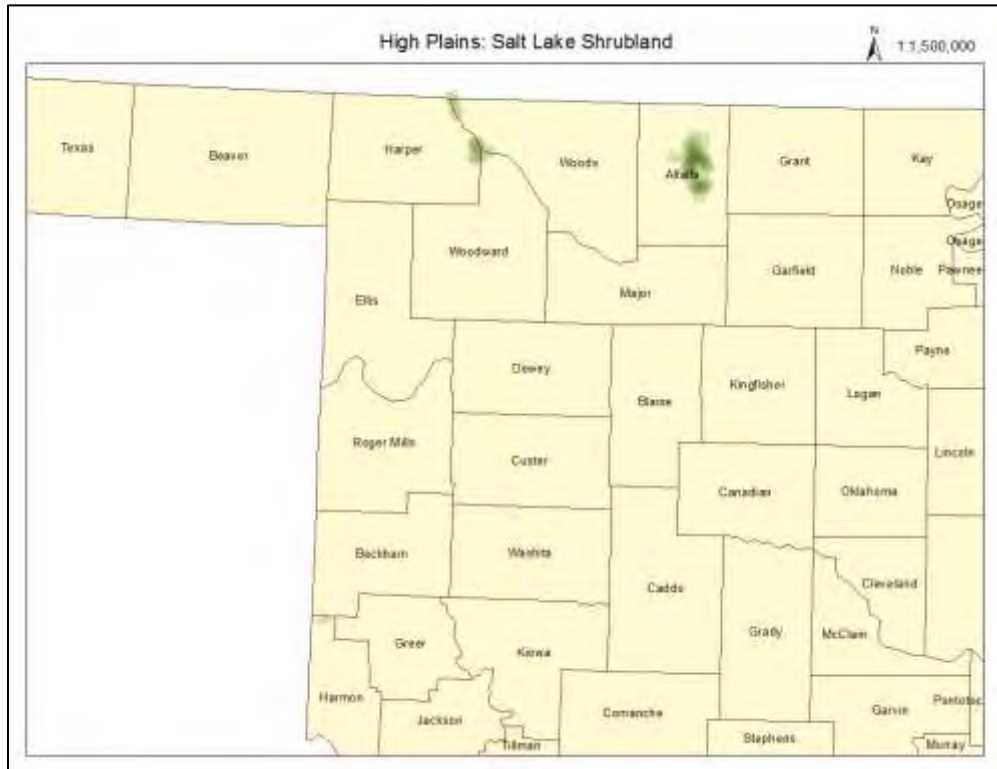
High Plains: Salt Marsh

Area: 4,552 acres (1,842 ha)

Description of Mapped Type: This type is mapped on moist flats with soils often derived from gypsum upstream or upslope. Water regimes and salinity often vary over short distances, and this type may be quite patchy. Common species include American bulrush, pale spikerush, and saltgrass.
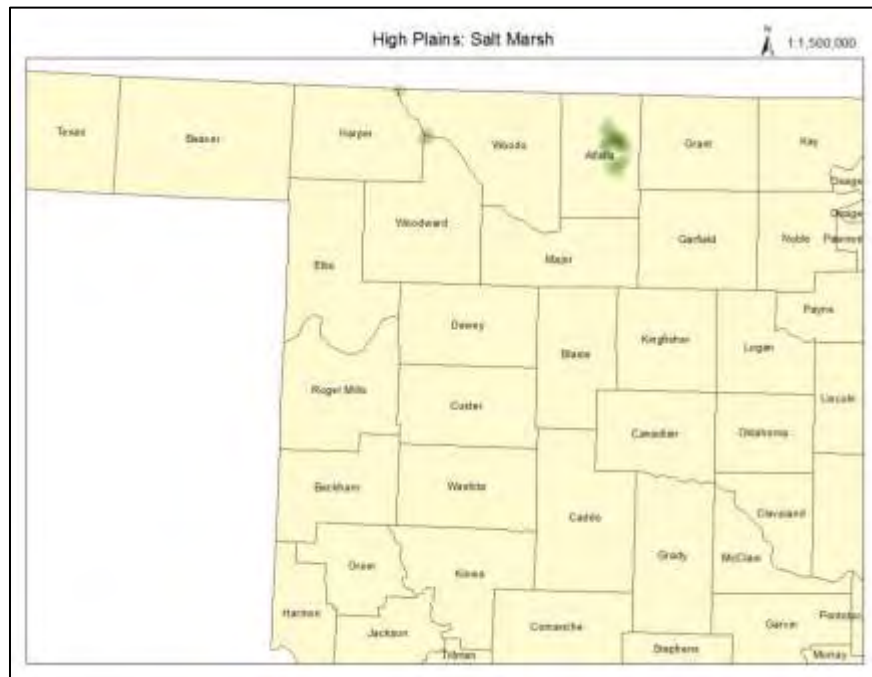
High Plains: Salty Grassland

Area: 11,985 acres (4,850 ha)

Description of Mapped Type: This type is mapped on moist flats with soils often derived from gypsum upstream or upslope. Salinity and moisture regime often vary across short distances and the type is often patchy. Common herbaceous species include saltgrass, foxtail barely, alkali sacaton, annual rabbitsfoot grass, western ragweed, southern annual saltmarsh aster, weeping lovegrass, and salt heliotrope. Saltcedar species, mesquite (in range), and willow baccharis may be present.

High Plains: Sand Prairie

Area: 869,727 acres (351,966 ha)

Description of Mapped Type: This type is mapped over aeolian or alluvial deep sands. Common herbaceous species in the modern landscape include little bluestem, sand bluestem, switchgrass, sand dropseed, sand lovegrass, sandburs, western ragweed, field brome, cheatgrass, Bermudagrass, and giant sandreed. Common shrubs include sand sagebrush, Chickasaw plum, Havard shin oak (within range), and soapweed yucca.
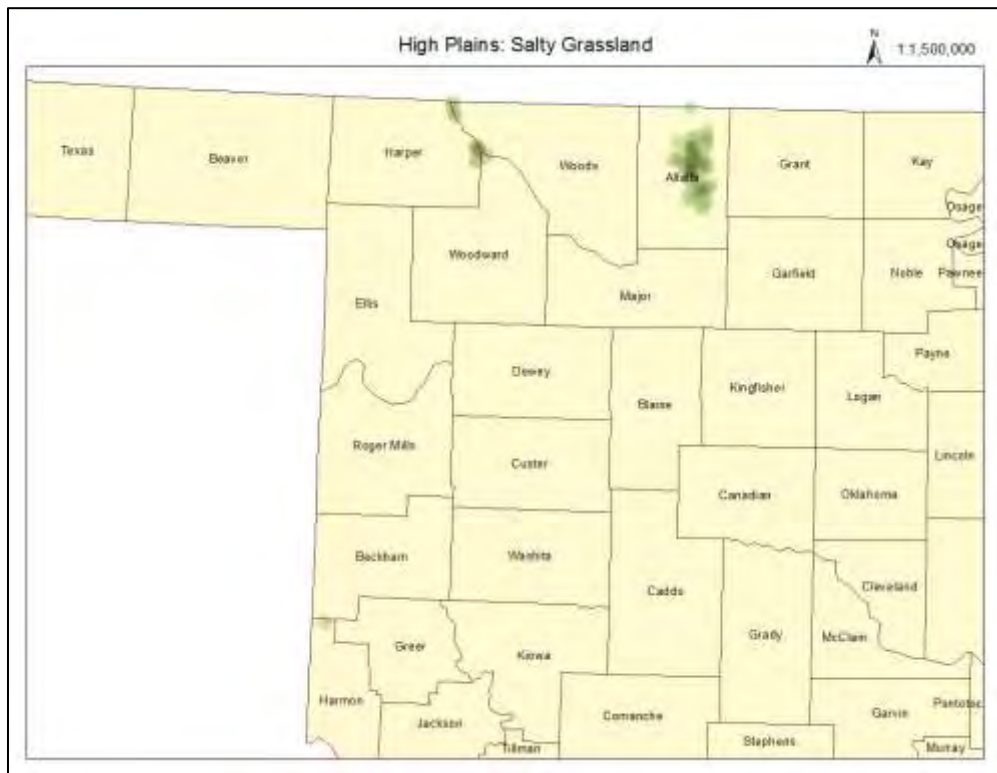
High Plains: Sandhill Shinnery Shrubland

Area: 116,916 acres (47,314 ha)

Description of Mapped Type: This type is mapped over aeolian and alluvial deep sands where Havard shin oak is the prevailing dominant. Taller Havard shin oak/post oak hybrids may be present, and in some areas, blackjack oak may be present. Sand sagebrush, fragrant sumac, soapweed yucca, Chickasaw plum, and netleaf hackberry are common components. Little bluestem, sand dropseed, switchgrass, sand bluestem, and sandbur species are common grasses.
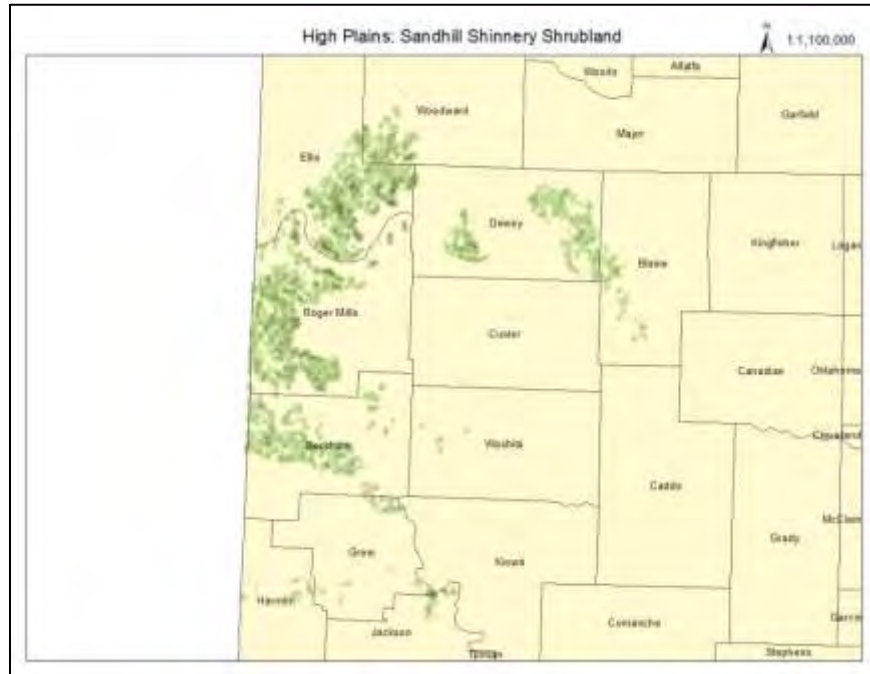
High Plains: Sandhill Shrubland

Area: 339,164 acres (137,255 ha)

Description of Mapped Type: This type is mapped over aeolian and alluvial deep sands where woody species other than Havard shin oak are the prevailing dominants, although it may be present, within range. The type often occurs interspersed with grasslands. Common species in the modern landscape include sand sagebrush, fragrant sumac, Chickasaw plum, sand bluestem, sand dropseed, cheatgrass, western ragweed, soapweed yucca, grama species, Schweinitz flatsedge, yellow sundrops, and annual buckwheat.

High Plains: Sandy Deciduous Shrubland

Area: 147,746 acres (59,791 ha)

Description of Mapped Type: This type is over or near sandy soils, but not mapped on deep sands. Components of the High Plains: Sand Prairie such as sand sagebrush, soapweed yucca, Chickasaw plum, little bluestem, sand dropseed, sand lovegrass, sandburs, western ragweed, field brome, cheatgrass, and Bermudagrass are common. However, components associated with deep sands such as sand bluestem and giant sandreed are generally lacking.
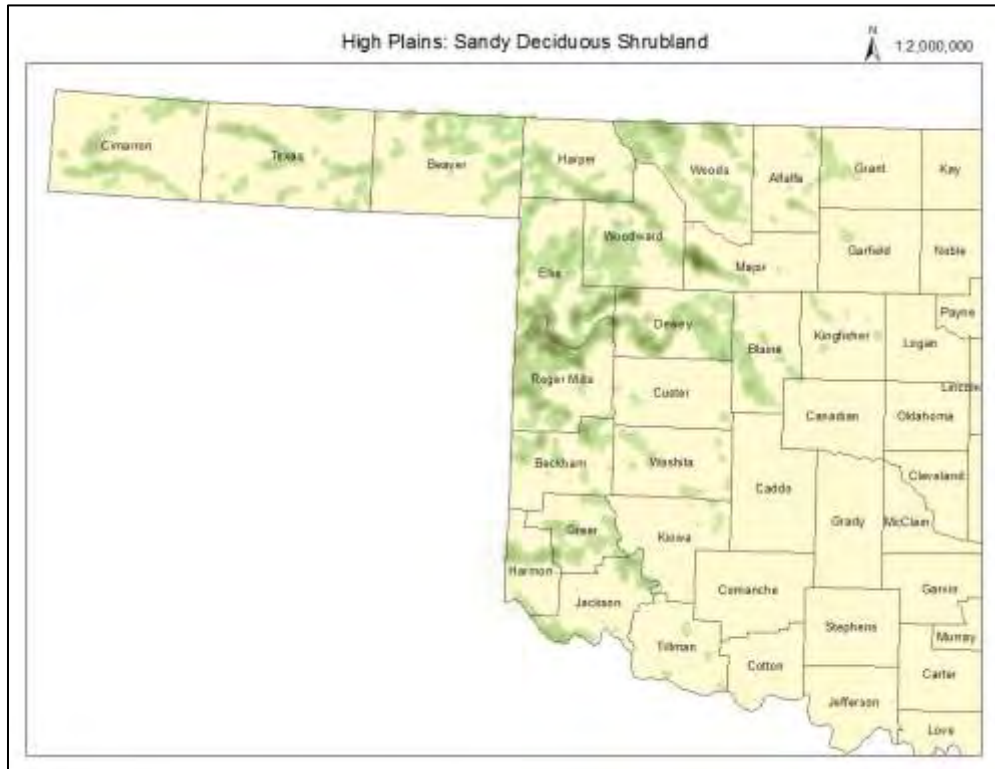
High Plains: Shortgrass Prairie

Area: 1,574,963 acres (637,366 ha)

Description of Mapped Type: This type is mapped over a broad range of generally medium-textured soils of the High Plains, and grades into Central Mixedgrass types to the east. Grazing-tolerant species such as blue grama, buffalograss, sand dropseed, broom snakeweed, soapweed yucca, and *Opuntia* species are common in the modern landscape. Mid grasses such as little bluestem, sideoats grama, and silver bluestem are often important. Other common herbaceous species may include plains blackfoot and Rocky Mountain zinnia. Sand sagebrush, white sagebrush, and soapweed yucca are common woody components.
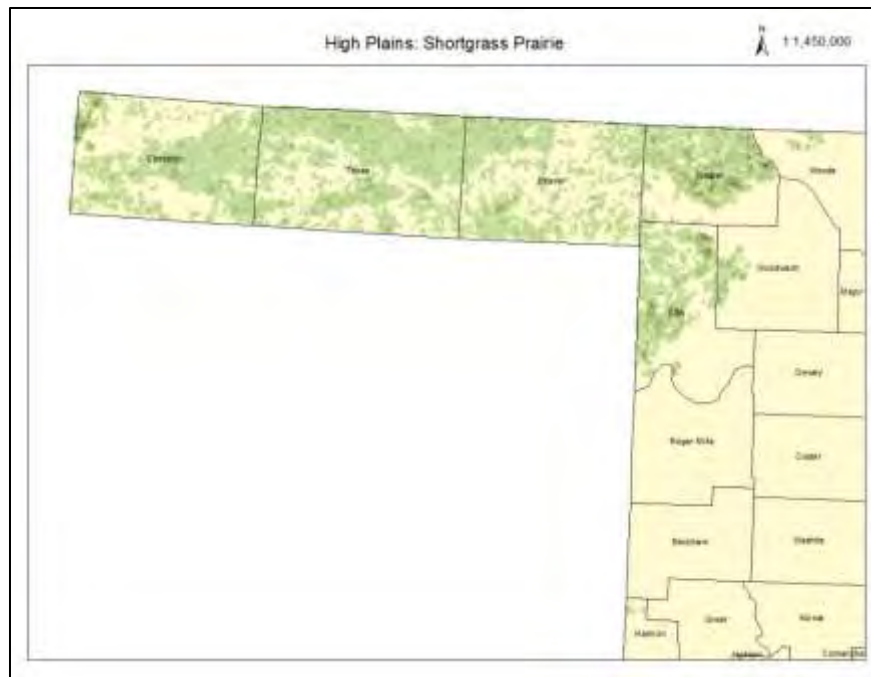
High Plains: Tallgrass Prairie

Area: 7,875 acres (3,187 ha)

Description of Mapped Type: This type is mapped over soils that are well-watered in bottoms in the High Plains. Mowed hay meadows may be dominated by grasses such as big bluestem, yellow Indiangrass, switchgrass, western wheatgrass, and little bluestem. In the modern landscape, this type may be grazed, and can be dominated by a variety of grazing-tolerant grasses and forbs such as Bermudagrass, cheatgrass, brome species, grama species, and buffalograss.

Open Water

Area: 816,379 acres (330,378 ha)

Description of Mapped Type: This type was open water during all seasons at the time of data acquisition for the current classification (circa 2012).

Osage Plains: Tallgrass Prairie/Pasture

Area: 2,006,750 acres (812,104 ha)

Description of Mapped Type: This type circumscribes a variety of mainly grazed grasslands, but some native hay meadows are also represented. In the modern landscape, non-native and grazing-tolerant species such as Bermudagrass, tall fescue, field brome, western (Cuman) ragweed, prairie broomweed, and sericea lespedeza are common. Some areas have native tallgrass elements such as little bluestem, switchgrass, big bluestem, heath aster, and Canada goldenrod. Woody elements may include common persimmon, eastern redcedar, sugar hackberry, elm species, and honeylocust.
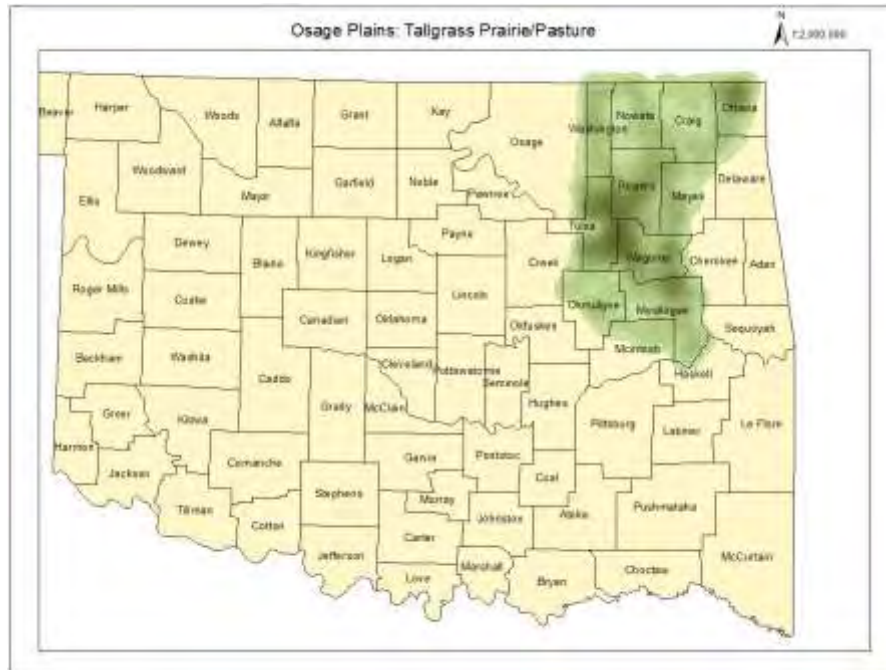
Ozark-Ouachita: Dry Mixed Oak - Evergreen Woodland

Area: 34,114 acres (13,805 ha)

Description of Mapped Type: This type is characterized by a mix of eastern redcedar (mainly north, in the Ozarks) or pine species (mainly south, in the Ouachitas) and oaks, and is often successional or a result of past disturbance. Common deciduous tree species include post oak, white oak, black oak, black hickory, chinkapin oak, blackjack oak, black walnut, sugar hackberry, and slippery elm.

Ozark-Ouachita: Dry Oak Woodland

Area: 1,617,568 acres (654,607 ha)

Description of Mapped Type: This common and broadly circumscribed type is mapped on upland flats and moderate slopes. Common tree species include post oak, white oak, black oak, blackjack oak, black hickory, other hickory species, slippery elm, sugar hackberry, and black walnut. Shortleaf pine or eastern redcedar may also be components in low density.

Ozark-Ouachita: Dry Oak Woodland Young Regrowth

Area: 34,784 acres (14,076 ha)

Description of Mapped Type: This type is mapped on relatively dry site types and represents mainly disturbed areas and may include pastures, forest edges, and clear-cuts where young pines have been planted, although these areas could not be identified as having been clear-cut between 2000 and 2012. Young trees and successional shrubs characterize the type. Common woody species include post oak, black oak, blackjack oak, hickory species, winged elm, slippery elm, common persimmon, sassafras, black cherry, eastern redbud, eastern redcedar and sumac species. Vines such as poison ivy, Virginia creeper, greenbrier species, and blackberry species are common.

Ozark-Ouachita: Dry-Mesic Mixed Oak – Evergreen Forest

Area: 101,103 acres (40,915 ha)

Description of Mapped Type: This type was mapped over slopes >20% and on low flats below hills or mountains. Composition is similar to the Ozark-Ouachita: Dry-Mesic Oak Forest type, with the addition of shortleaf pine (or loblolly pine, mainly in the south) as a common component. These mainly closed-canopy forests may contain white oak, hickory species, black oak, northern red oak, and chinkapin oak as important species. This type may also include areas where forestry practices have increased the dominance of pine.
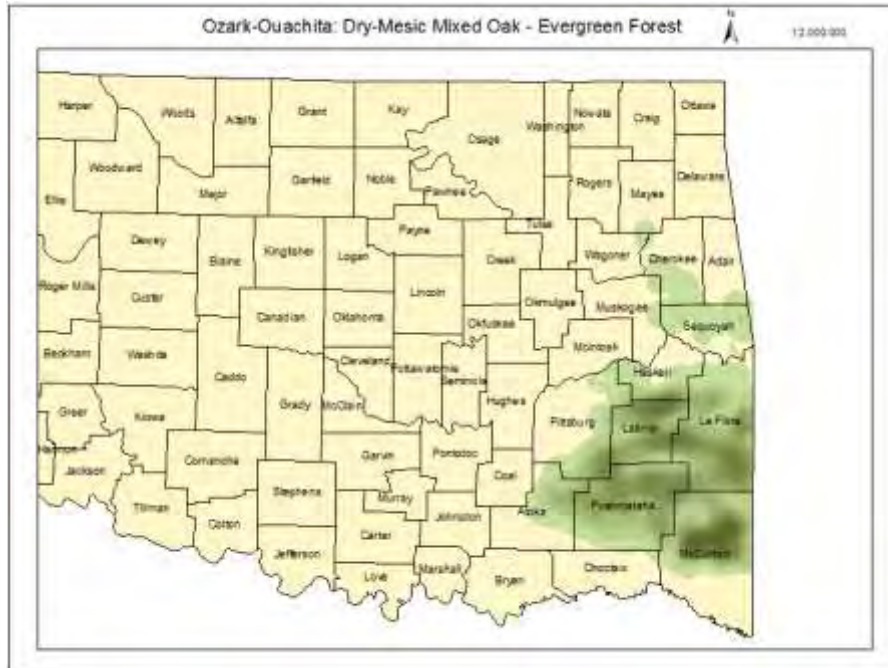
Ozark-Ouachita: Dry-Mesic Oak Forest

<u>Area</u>: 797,130 acres (322,587 ha)

<u>Description of Mapped Type:</u> This type was mapped over slopes >20% and on low flats. Closed-canopy forests with species such as white oak, hickory species, black oak, northern red oak, and chinkapin oak are characteristic of this type. The most mesic areas may contain sugar maple as an important component. Flowering dogwood, eastern redbud, hophornbeam, and sassafras are common woody understory species.

Ozark-Ouachita: Dry-Mesic Oak Woodland Young Regrowth

Area: 17,498 acres (7,081 ha)

Description of Mapped Type: This type is mapped on relatively mesic site types and represents mainly disturbed areas and may include pastures, forest edges, or clear-cuts where young pines have been planted, but these stands could not be identified as having been cut between 2000 and 2012. Young trees and successional shrubs characterize the type. Common woody species include post oak, black oak, white oak, chinkapin oak, blackjack oak, hickory species, winged elm, slippery elm, common persimmon, sassafras, black cherry, redbud, and sumac species. Vines such as poison ivy, Virginia creeper, greenbrier species, and blackberry species are common.
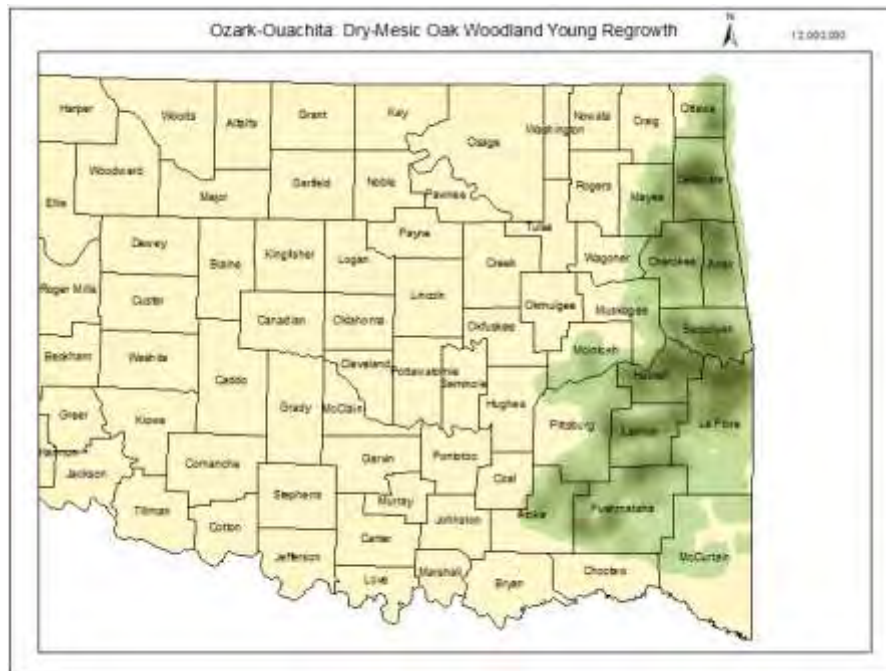
Ozark-Ouachita: Montane Stunted Oak Woodland

Area: 1,053 acres (426 ha)

Description of Mapped Type: This type is mapped at the highest elevations of the Ouachita Mountains in Latimer and LeFlore counties. Gnarled white oaks often dominate the sites, with post oak, blackjack oak, black hickory, and mockernut hickory also present. Other woody components include white fringetree, hophornbeam, common serviceberry, and Blue Ridge blueberry.

Ozark-Ouachita: Pasture/Prairie

Area: 959,040 acres (388,110 ha)

Description of Mapped Type: This type circumscribes broad variation, but in the modern landscape most representatives are grazed pastures. Common species are non-native and grazing tolerant grasses and forbs such as Bermudagrass, tall fescue, annual ragweed, field brome, purpletop tridens, sericea lespedeza, prairie broomweed, and sneezeweed. Less heavily grazed areas may support grasslands with species such as little bluestem, big bluestem, and yellow Indiangrass. Woody species such as post oak, black walnut, common persimmon, winged elm, sumac species, and eastern redcedar may be components.
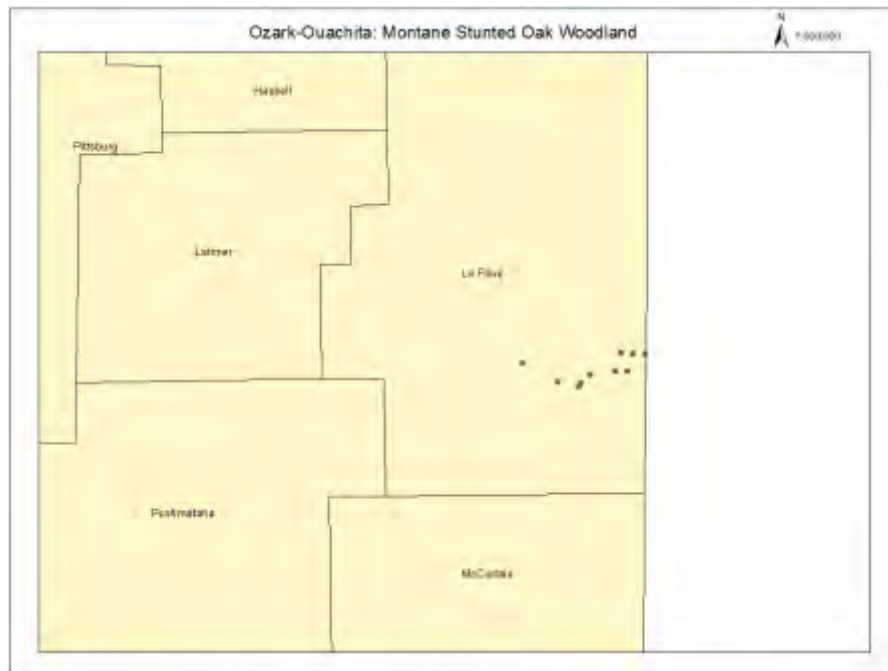
**Ozark-Ouachita: Riparian Barrens**

Area: 145 acres (59 ha)

Description of Mapped Type: These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands, riverbeds, and stream edges.

Ozark-Ouachita Riparian Deciduous Shrubland and Young Woodland

Area: 5,541 acres (2,242 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Stream gradient tends to be relatively high, and species such as hazel alder, river birch, willow species, sycamore, and oaks may grow near steep banks or adjacent to stream bed cobble.

Ozark-Ouachita: Riparian Deciduous Shrubland and Young Woodland   1:2,000,000

Ozark-Ouachita: Riparian Evergreen Woodland and Shrubland

Area: 39,816 acres (16,113 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and shortleaf or loblolly pine (mainly Ouachitas), or eastern redcedar (mainly Ozarks), may be the prevailing dominant. Other species such as sycamore, river birch, sweetgum, maples, oaks, and hazel alder may grow near steep banks or adjacent to stream bed cobble.

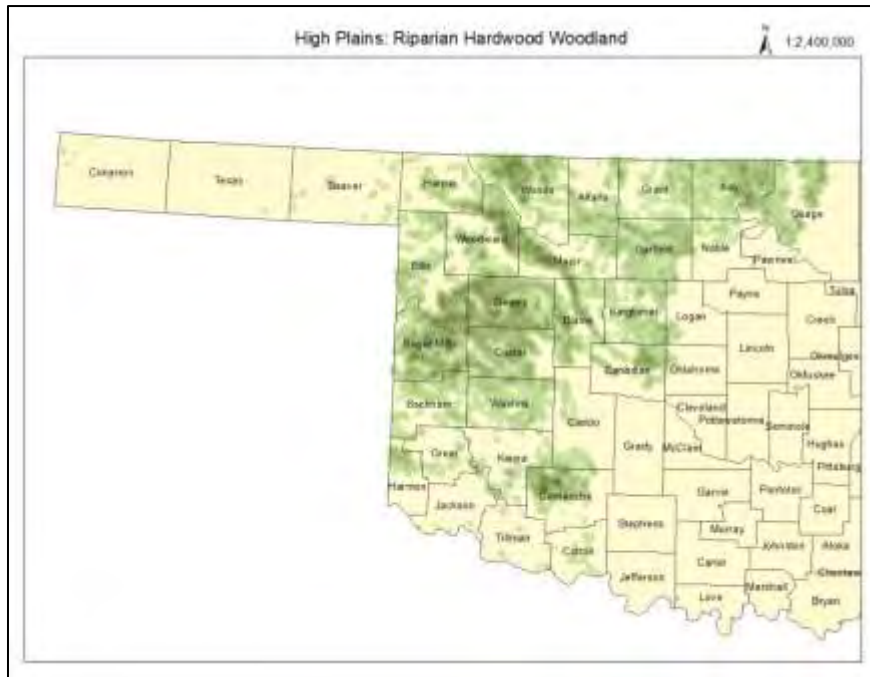## Ozark-Ouachita: Riparian Hardwood Woodland

Area: 197,624 acres (79,975 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Stream gradient tends to be relatively high, and species such as sycamore, river birch, sweetgum, maples, oaks, and hazel alder may grow near steep banks or adjacent to stream bed cobble.

Ozark-Ouachita: Riparian Herbaceous Wetland

Area: 1,048 acres (424 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.

Ozark-Ouachita: Riparian Herbaceous Wetland

## Ozark-Ouachita: Riparian Mixed Evergreen – Hardwood Woodland

Area: 43,738 acres (17,700 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Shortleaf or loblolly pine (mainly Ouachitas), or eastern redcedar (mainly Ozarks), is a major component. Other species such as sycamore, river birch, sweetgum, maples, oaks, and hazel alder may grow near steep banks or adjacent to stream bed cobble.
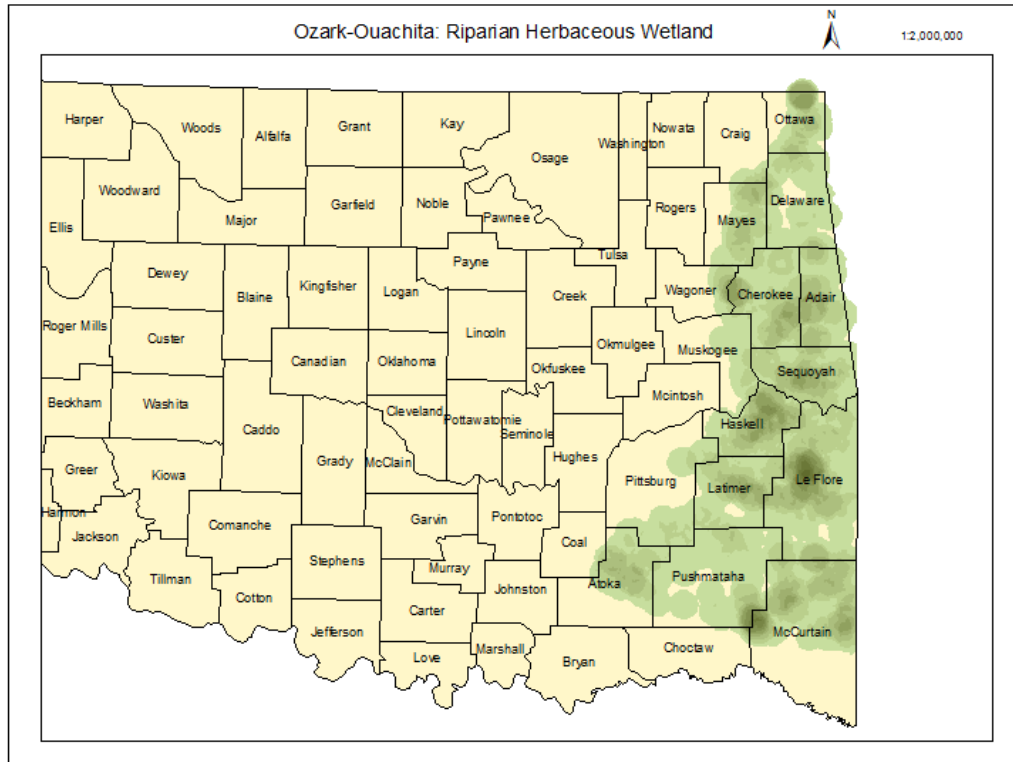
Ozark-Ouachita: Shortleaf Pine - Oak Forest

Area: 686.541 acres (277,834 ha)

Description of Mapped Type: This type includes mixed stands of shortleaf or loblolly pine and oaks, and includes more natural stands as well as areas that are more intensively managed for forest products. These areas had generally not been clear-cut in the period from 2000 to 2012. Important trees may include post oak, black or mockernut hickory, black oak, white oak, northern or southern red oak, and blackjack oak. Common understory species may include flowering dogwood, hophornbeam, winged elm, St. Johnswort, and farkleberry.

Pine Plantation

Area: 535,838 acres (216,846 ha)

Description of Mapped Type: This type consists mainly of loblolly pine plantations, although shortleaf pine is also planted. These areas were mature enough to be dominated by pines at the time of satellite data collection (circa 2012).
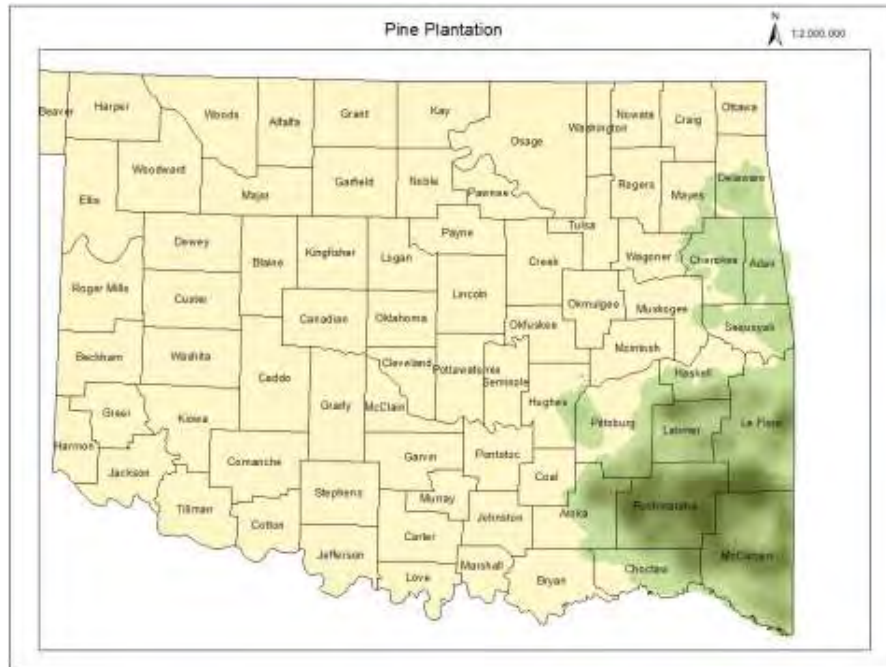
Pine Plantation - 1 - 3 meters

Area: 146,053 acres (59,106 ha)

Description of Mapped Type: This type consists of young pine plantations that were not mature enough to be clearly dominated by pines at the time of data collection (circa 2012).
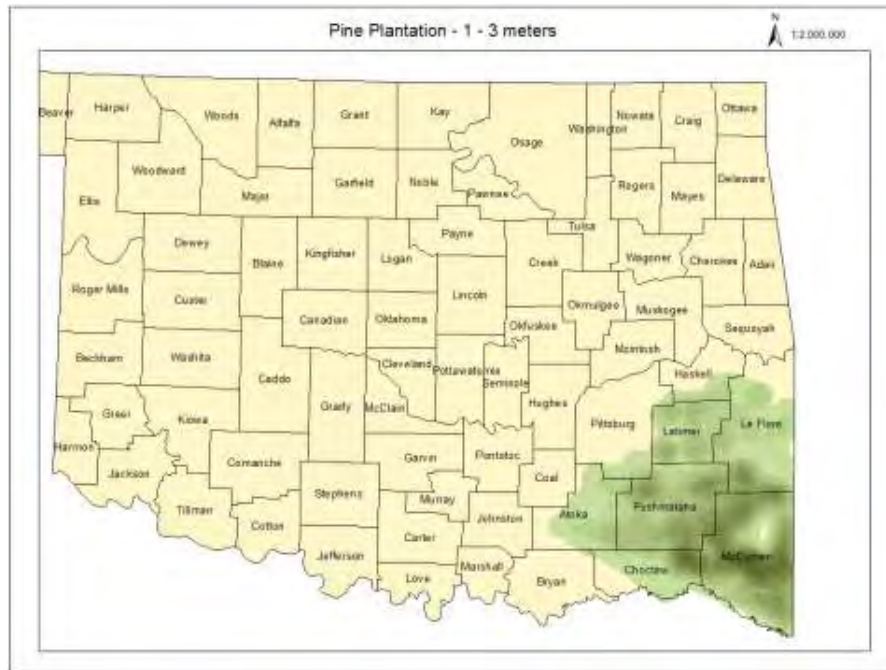
Planted Non-native and/or Native Grasses

Area: 1,253,950 acres (507,456 ha)

Description of Mapped Type: Grasslands or pasture typically planted with native grasses such as sideoats grama or little bluestem. Non-native grasses such as yellow bluestem or weeping lovegrass may be dominant or present.
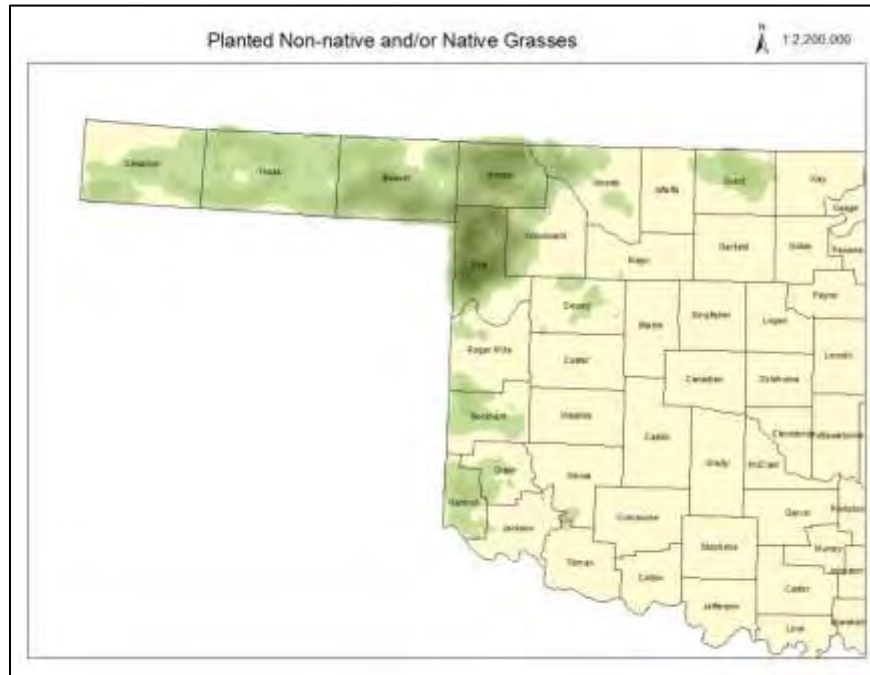
Pleistocene Sands: Blackjack Oak - Eastern Redcedar Woodland

Area: 54,229 acres (21,946 ha)

Description of Mapped Type: This type is mapped on deep, aeolian or alluvial sands and is characterized by woodlands with fairly low tree diversity that contain blackjack oak among the dominants. Post oak may be present in the eastern part of the range of the type, and Havard shin oak may occur as an understory component within its range. Eastern redcedar is often an important component. Other woody components may include gum bumelia, western soapberry, netleaf hackberry, American elm, black locust, and Siberian elm. Common shrubs include skunkbush sumac, Chickasaw plum, and sand sagebrush.
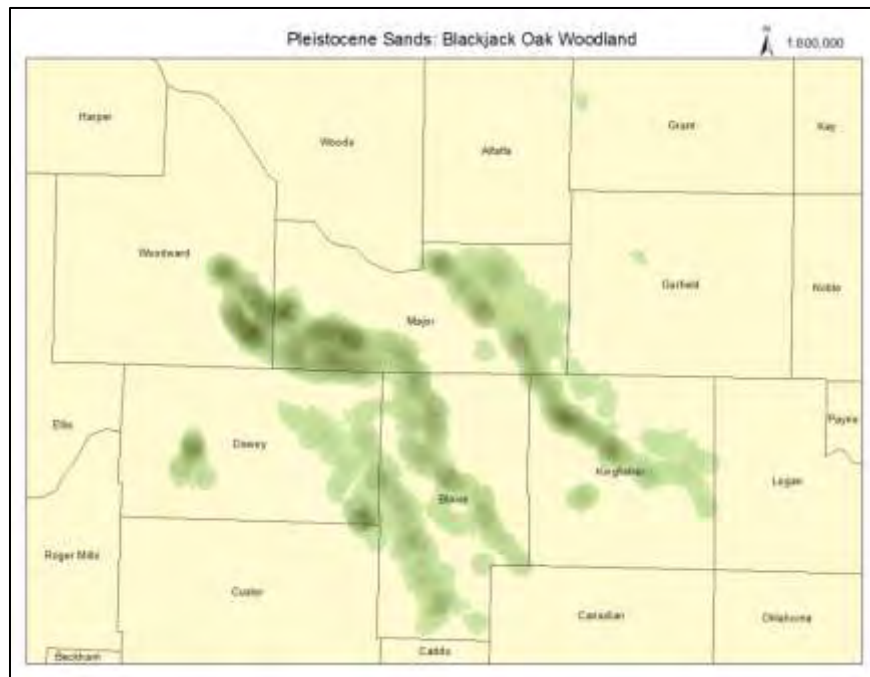
Pleistocene Sands: Blackjack Oak Woodland

Area: 90,764 acres (36,731 ha)

Description of Mapped Type: This type is mapped on deep, aeolian or alluvial sands and is characterized by woodlands with fairly low tree diversity that contain blackjack oak among the dominants. Post oak may be present in the eastern part of the range of the type, and Havard shin oak may occur as an understory component within its range. Other woody components may include gum bumelia, western soapberry, netleaf hackberry, American elm, black locust, eastern redcedar, and Siberian elm. Common shrubs include skunkbush sumac, Chickasaw plum, and sand sagebrush.

Post Oak Savanna: Pasture/Grassland

Area: 294,441 acres (119,156 ha)

Description of Mapped Type: This type is mainly represented by grazed pastures dominated by non-native and grazing-tolerant species in the modern landscape. Common components include Bermudagrass, field brome, tall fescue, western (Cuman) ragweed, purpletop tridens, and silver bluestem. Woody components may include post oak, winged elm, Osage orange, pecan, honeylocust, water oak, and eastern redcedar.
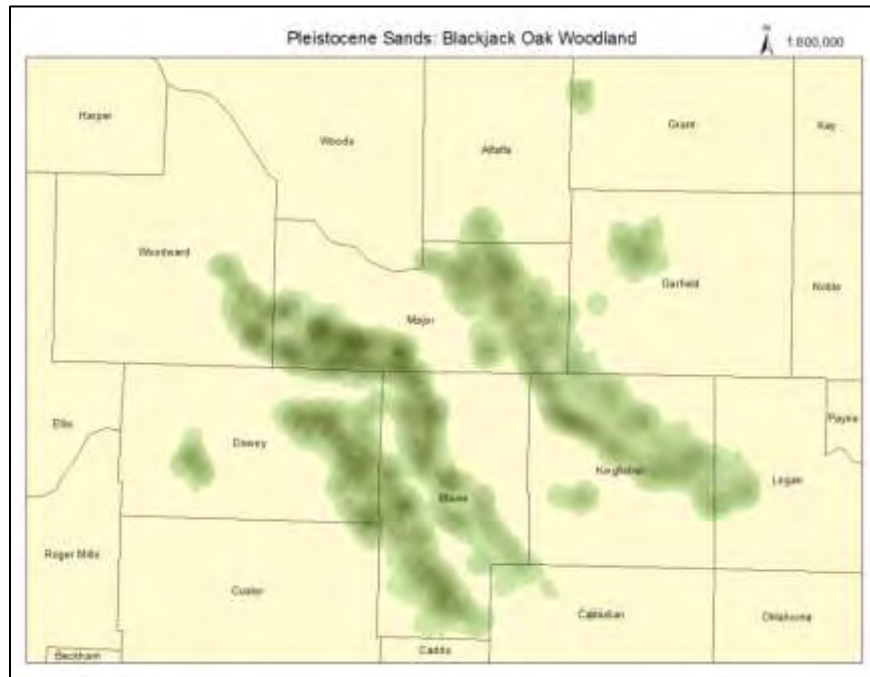
Post Oak Savanna: Post Oak - Eastern Redcedar Sandyland Woodland

Area: 184 acres (75 ha)

Description of Mapped Type: This type is mapped over more or less deep sands and is characterized by generally open woodlands where eastern redcedar is a significant component. Common trees include post oak, blackjack oak, sugar hackberry, southern red oak, hickory species, and water oak. Shrubs may include winged elm, farkleberry, and flowering dogwood.
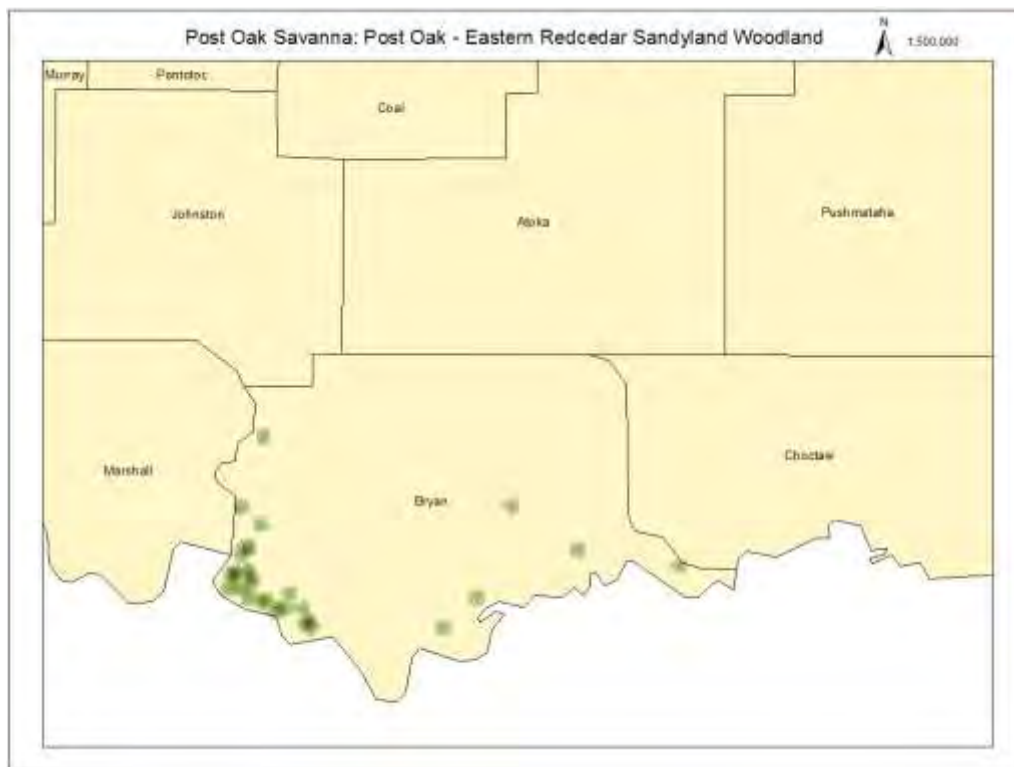
Post Oak Savanna: Post Oak - Eastern Redcedar Woodland

Area: 2,053 acres (831 ha)

Description of Mapped Type: This type is characterized by woodlands with eastern redcedar as a significant component. Common trees include post oak, blackjack oak, sugar hackberry, water oak, southern red oak, and hickory species. Shrubs may include winged elm, farkleberry, and flower dogwood.

Post Oak Savanna: Post Oak - Eastern Redcedar Woodland

Post Oak Savanna: Post Oak Sandyland Woodland

Area: 3,340 acres (1,352 ha)

Description of Mapped Type: This type is mapped over more or less deep sands and common trees include post oak, blackjack oak, water oak, southern red oak, and hickory species. Open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.

Post Oak Savanna: Post Oak Sandyland Woodland

Post Oak Savanna: Post Oak Woodland

Area: 86,577 acres (35,035 ha)

Description of Mapped Type: This type is characterized by woodlands dominated by species such as post oak, blackjack oak, water oak, hickory species, pecan, cedar elm, and sugar hackberry. Shrubs may include gum bumelia, American beautyberry, possumhaw, flowering dogwood, and farkleberry.
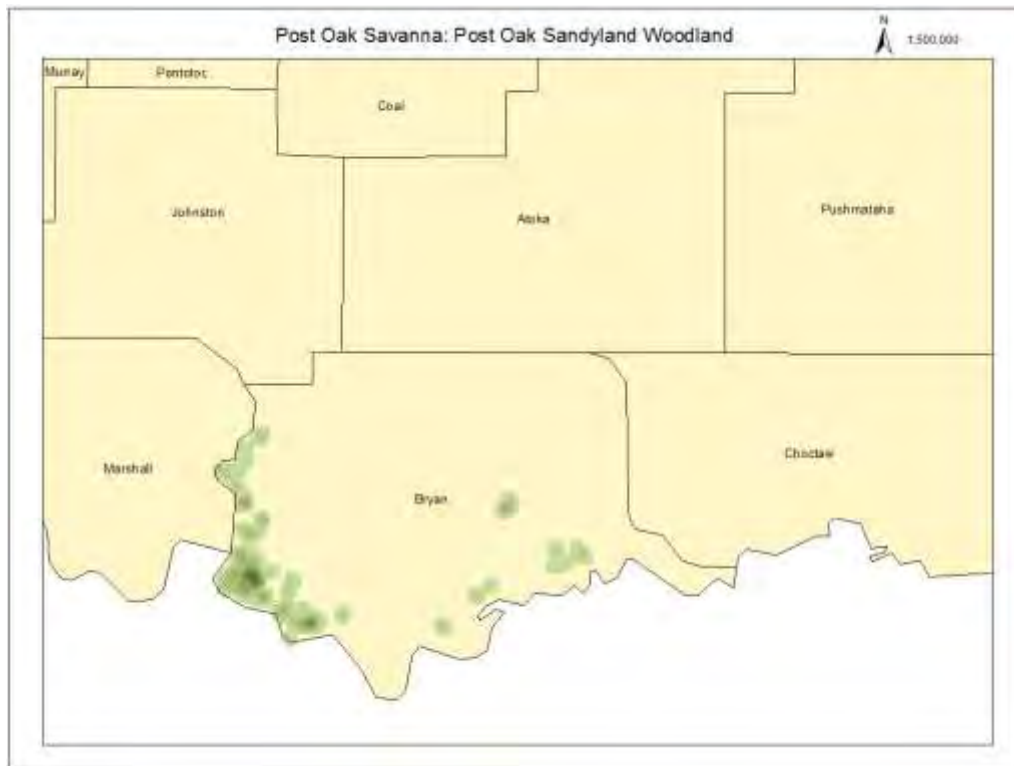
Post Oak Savanna: Sandyland Shrubland and Grassland

Area: 7,137 acres (2,888 ha)

Description of Mapped Type: This type is mapped over more or less deep sands and in the modern landscape if most often characterized by grazed pasture with non-native and grazing-tolerant species such as Bermudagrass, tall fescue, annual ragweed, and sandbur species. Some areas with deeper sands may contain species such as little bluestem, Florida snake-cotton, pinweed, southern jointweed, and Alabama supplejack. Vines such as eastern poison ivy and greenbriar species are common.
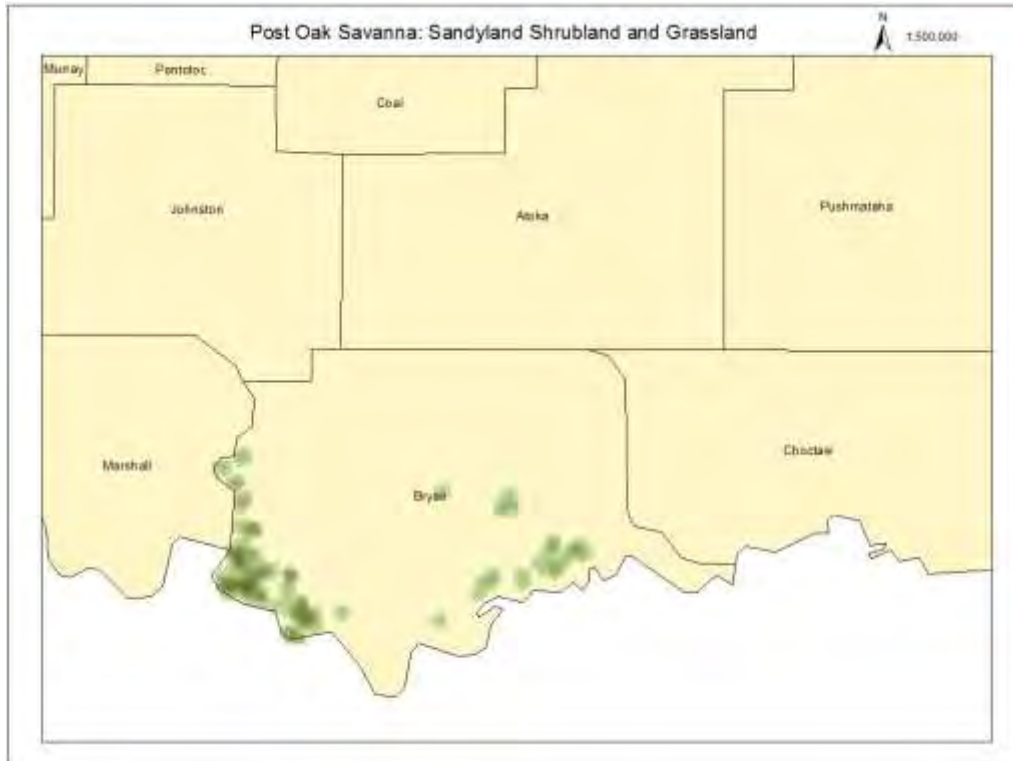
Post Oak Savanna: Young Woodland Regrowth

Area: 1,615 acres (654 ha)

Description of Mapped Type: This type represents pastures and woodland edges with sparse successional vegetation. Common woody species include winged elm, post oak, water oak, blackjack oak, common persimmon, honey locust, Osage orange, black hickory, eastern redcedar, and pecan. Herbaceous areas generally have non-native and grazing tolerant species such as Bermudagrass, field brome, tall fescue, purpletop tridens, and silver bluestem. Vines such as eastern poison ivy and greenbriar are common.
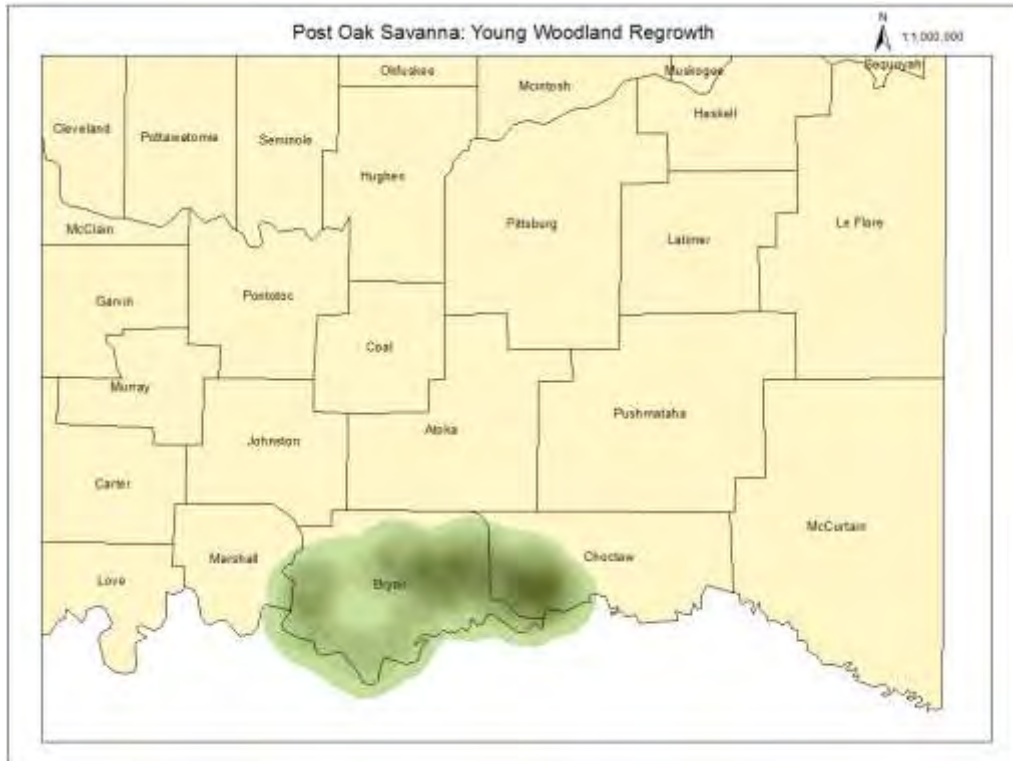
Quarry

<u>Area</u>: 18,574 acres (7,517 ha)

<u>Description of Mapped Type:</u> This type is mapped where evidence of quarries, with bare ground, was present, only in the eastern half of the state (Phase 1, see Figure 1).

Row Crops

Area: 7,112,167 acres (2,878,196 ha)

Description of Mapped Type: This type includes all cropland where fields are fallow for some portion of the year. Some fields may rotate into and out of cultivation frequently, and year-round cover crops and tame hay fields are generally mapped as prairie/pasture types.

Ruderal Deciduous Shrubland and Young Woodland

Area: 406,498 acres (164,504 ha)

Description of Mapped Type: This type is mapped on prairie soils across much of the state and consists of mainly successional young woodlands or shrublands, although some more natural communities may occur. Common components vary from region to region, and may include honeylocust, winged elm, black locust, post oak, blackjack oak, pecan, Chickasaw plum, western soapberry, common persimmon, green ash, sumac species, hackberry species, elm species, and Osage orange. Eastern redcedar is not a major component of these communities but may be present.
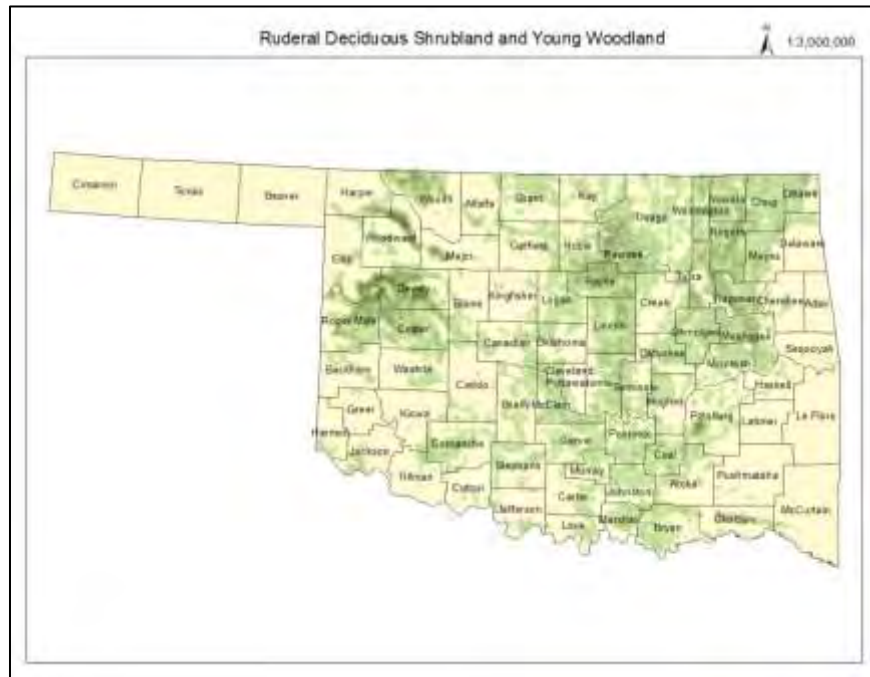
Ruderal Deciduous Woodland

Area: 853,586 acres (345,434 ha)

Description of Mapped Type: This type is mapped on prairie soils across much of the state and consists mainly of relatively closed woodlands that vary a great deal in composition. Common woody species may include hackberry species, green ash, other ash species, elm species, honeylocust, black locust, catalpa, western soapberry, pecan, oak species, winged elm, and Osage orange. Eastern redcedar may be a component.

Ruderal Eastern Redcedar Woodland and Shrubland

Area: 155,661 acres (62,994 ha)

Description of Mapped Type: This type is mapped on prairie soils across much of the state, and consists of shrublands or woodlands where eastern redcedar is the most important species. Common woody components vary by region, and may include hackberry species, winged elm, other elm species, ash species, post oak, honeylocust, black locust, western soapberry, lotebush, post oak, and Osage orange.

Ruderal Mesquite Shrubland

Area: 21,037 acres (8,513 ha)

Description of Mapped Type: This type is mapped over prairie soils and contains mesquite among the dominants. Other common components may include netleaf hackberry, lotebush, *Opuntia* species, cheatgrass, broom snakeweed, prairie broomweed, Bermudagrass, and sand dropseed.
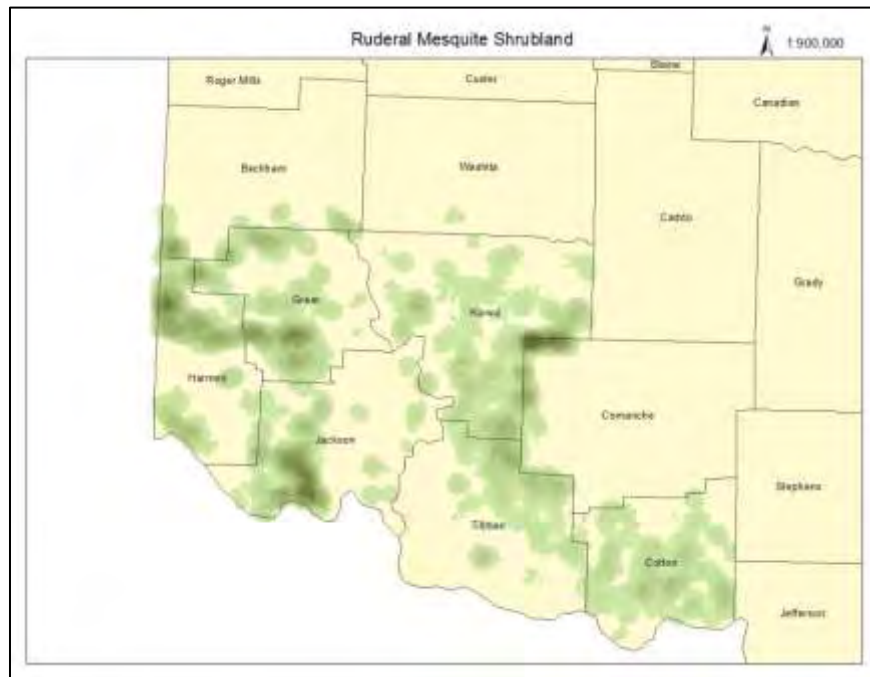
Ruderal Mixed Deciduous – Eastern Redcedar Woodland

Area: 64,456 acres (26,085 ha)

Description of Mapped Type: This type is mapped on prairie soils across much of the state, and consists of relatively dense woodlands where eastern redcedar is a significant component. Common woody components vary by region, and may include hackberry species, winged elm, other elm species, green ash, other ash species, honeylocust, black locust, western soapberry, lotebush, post oak, and Osage orange.

Ruderal Plains Shrubland

Area: 132,568 acres (53,649 ha)

Description of Mapped Type: This type is mapped over prairies soils of western Oklahoma, and may contain a wide variety of shrubs and patches of trees that increase under grazing pressure. Common woody components may include soapweed yucca, sand sagebrush, white sagebrush, tree cholla, Chickasaw plum, Siberian elm, sugar hackberry, and soapberry. Common herbaceous species may include broom snakeweed, plains broomweed, and short grasses such as grama species, sand dropseed, and brome species.

South Central Interior: Bottomland Barrens

Area: 44,117 acres (17,854 ha)

Description of Mapped Type: This type is mapped where barrens occurred in river bottoms at the time of data collection, and may include sand or mud bars, river beds, and other barren or sparsely vegetation areas.

South Central Interior: Bottomland Barrens

South Central Interior: Bottomland Eastern Redcedar Woodland and Shrubland

Area: 10,161 acres (4,112 ha)

Description of Mapped Type: This type is mapped on bottomland soils where eastern redcedar is the prevailing dominant. Other components may include species such as green ash, gum bumelia, hackberry species, willow species, and elm species. Shortleaf or loblolly pine may be the dominant in the Ouachita region.

South Central Interior: Bottomland Eastern Redcedar Woodland and Shrubland
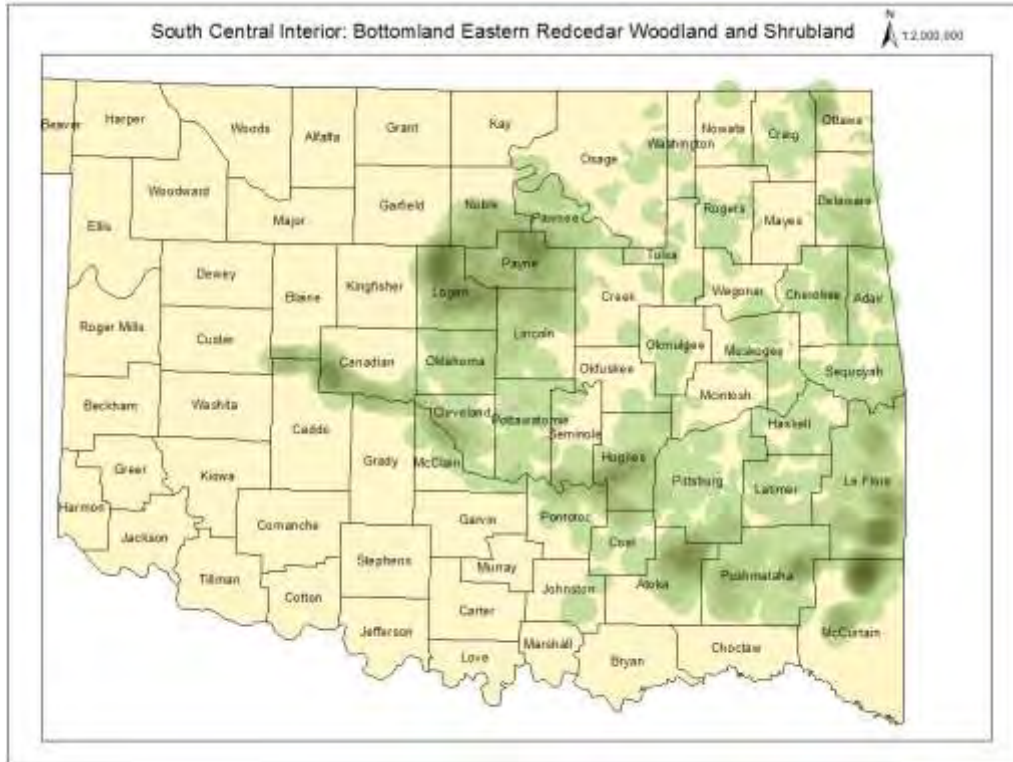
South Central Interior: Bottomland Hardwood Forest

Area: 1,079,749 acres (436,960 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common canopy dominants may include pecan, green ash, slippery elm, sycamore, sugar hackberry, honeylocust, boxelder, Shumard oak, bur oak, black willow, and American elm. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as Virginia wildrye, Indian woodoats, longleaf woodoats, Johnsongrass, Bermudagrass, and sedge species.

South Central Interior: Bottomland Herbaceous Wetland

Area: 52,767 acres (21,354 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.

South Central Interior: Bottomland Mixed Evergreen – Hardwood Forest

Area: 18,557 acres (7,510 ha)

Description of Mapped Type: This type is mapped on bottomland soils where eastern redcedar is among the most important species. Other components may include species such as green ash, gum bumelia, possumhaw, honeylocust, hackberry species, black walnut, willow species, and elm species. Shortleaf or loblolly pine may be the evergreen tree component, rather than eastern redcedar, in the Ouachita region.

South Central Interior: Bottomland Shrubland and Young Woodland

Area: 88,766 acres (35,922 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common shrubs or small trees include willow species, common buttonbush, green ash, winged elm, gum bumelia, sugar hackberry, boxelder, possumhaw, honeylocust, and black walnut. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as field brome, Bermudagrass, little barley, Johnsongrass, Virginia wildrye, and sedge species.

South Central Interior: Riparian Barrens

Area: 1,435 acres (581 ha)

Description of Mapped Type: This type is mapped where barrens occurred in narrow riparian areas at the time of data collection, and may include sand gravel bars, river beds, bare rock, and other barren or sparsely vegetation areas.

South Central Interior: Riparian Barrens

South Central Interior: Riparian Eastern Redcedar Woodland and Shrubland

Area: 7,631 acres (3,088 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers where eastern redcedar is the prevailing dominant. Other components may include species such as green ash, gum bumelia, hackberry species, willow species, and elm species.

South Central Interior: Riparian Eastern Redcedar Woodland and Shrubland

South Central Interior: Riparian Hardwood Woodland

Area: 314,920 acres (127,444 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common canopy dominants may include pecan, post oak, Shumard oak, green ash, slippery elm, sycamore, sugar hackberry, honeylocust, boxelder, bur oak, black willow, and American elm.
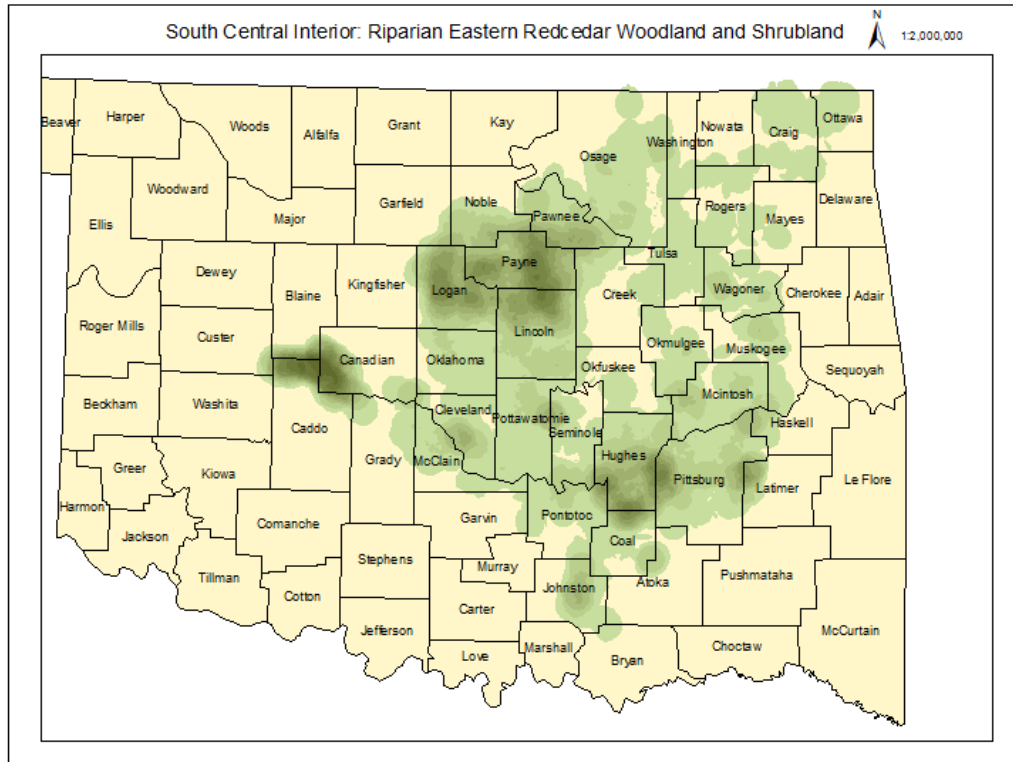
South Central Interior: Riparian Herbaceous Wetland

Area: 5,111 acres (2,068 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.

South Central Interior: Riparian Herbaceous Wetland

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South Central Interior: Riparian Mixed Evergreen – Hardwood Woodland

Area: 9,958 acres (4,030 ha)

Description of Mapped Type: This type is mapped along first and second order streams where eastern redcedar is among the most important species. Other components may include species such as green ash, gum bumelia, possumhaw, honeylocust, hackberry species, black walnut, willow species, and elm species.
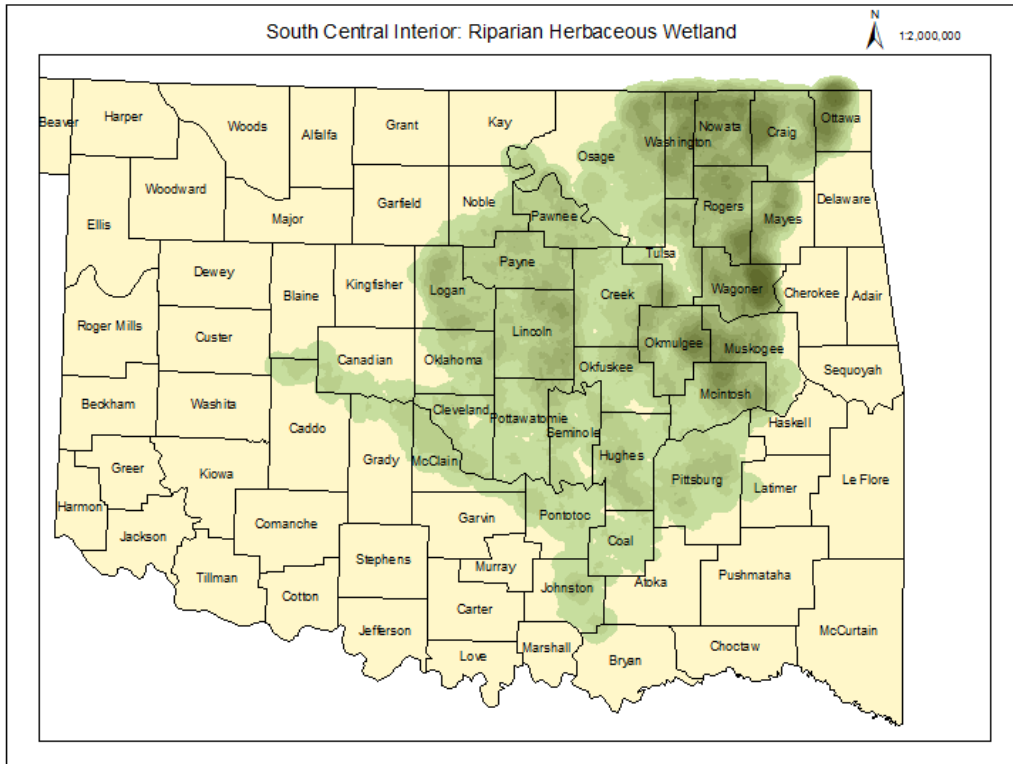
South Central Interior: Riparian Shrubland and Young Woodland

Area: 39,008 acres (15,786 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common shrubs or small trees include willow species, common buttonbush, green ash, slippery elm, winged elm, gum bumelia, sugar hackberry, boxelder, possumhaw, honeylocust, post oak, pecan, and black walnut.   Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as field brome, Bermudagrass, tall fescue, little barley, Johnsongrass, Virginia wildrye, and sedge species.

Southeastern Great Plains: Bottomland Barrens

Area: 12,276 acres (4,968 ha)

Description of Mapped Type: These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands, riverbeds, and stream edges. Stream scours tend to be dynamic in space from year to year.

South Central Interior: Bottomland Barrens

Southeastern Great Plains: Bottomland Eastern Redcedar Woodland and Shrubland

Area: 1,598 acres (647 ha)

Description of Mapped Type: This type is mapped on bottomland soils and circumscribes areas where eastern redcedar is the prevailing dominant. Other components may include species such as green ash, gum bumelia, Osage orange, honeylocust, western soapberry, hackberry species, willow species, and elm species.
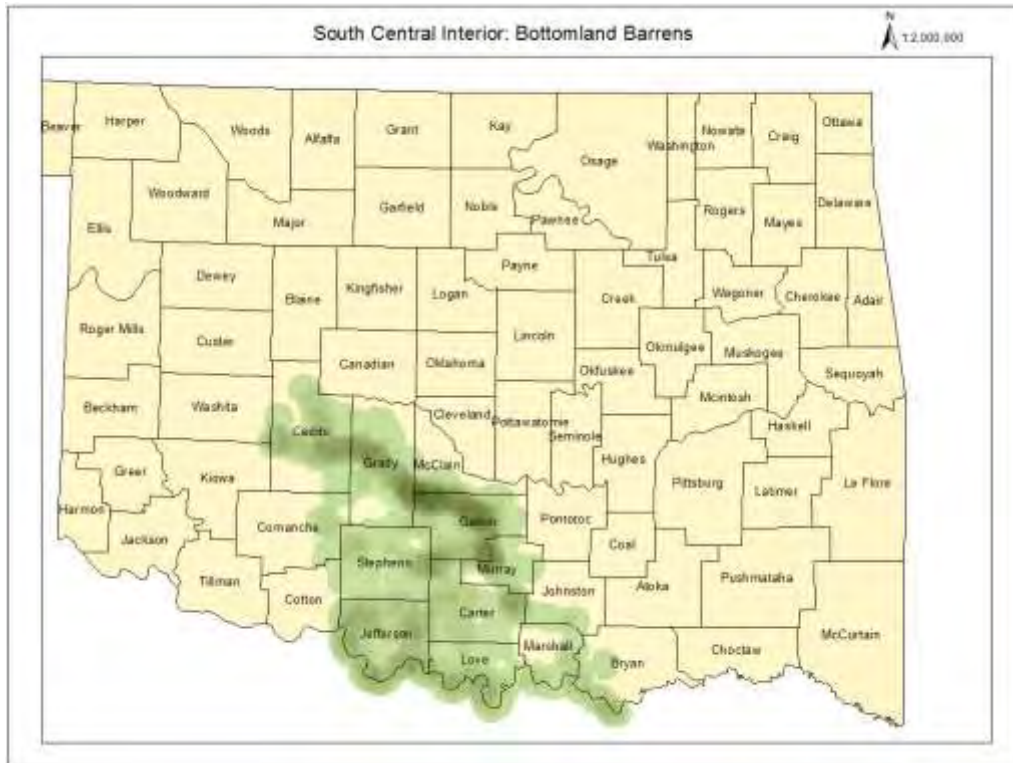
Southeastern Great Plains: Bottomland Hardwood Forest

Area: 211,781 acres (85,705 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common tree species include American elm, green ash, bur oak, sugar hackberry, slippery elm, black willow, sycamore, boxelder, black walnut, Shumard oak, western soapberry, and pecan. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as Virginia wildrye, Bermudagrass, Johnsongrass, field brome, Indian woodoats, longleaf woodoats, and sedge species.
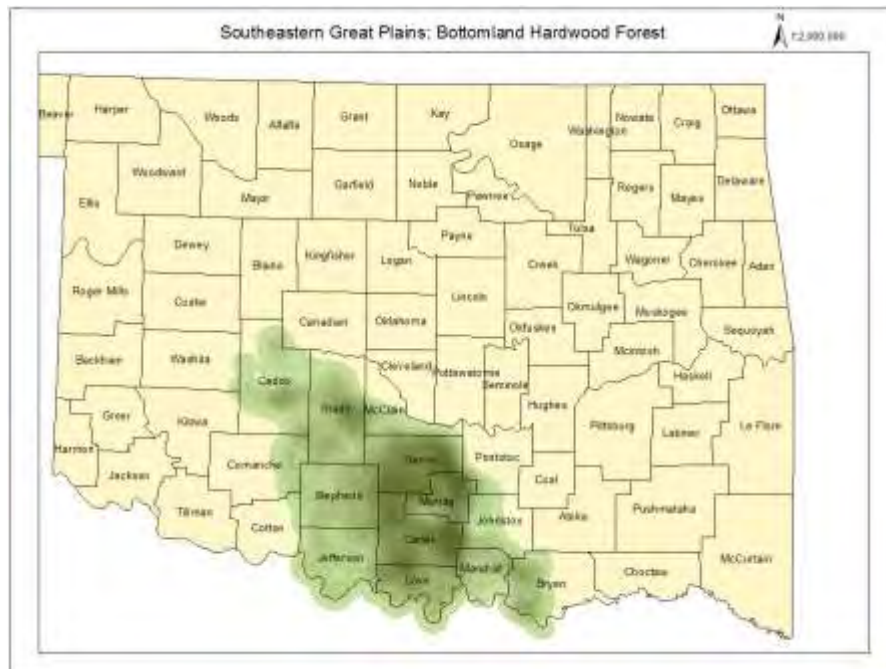
Southeastern Great Plains: Bottomland Herbaceous Wetland

Area: 6,256 acres (2,532 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.

Southeastern Great Plains: Bottomland Mixed Evergreen – Hardwood Forest

Area: 1,327 acres (537 ha)

Description of Mapped Type: This type is mapped on bottomland soils where eastern redcedar is among the most important species. Other components may include species such as green ash, gum bumelia, possumhaw, honeylocust, hackberry species, black walnut, willow species, Osage orange, and elm species.

Southeastern Great Plains: Bottomland Mixed Evergreen - Hardwood Forest

Southeastern Great Plains: Bottomland Shrubland and Young Woodland

Area: 19,186 acres (7,764 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common shrubs or small trees include willow species, common buttonbush, green ash, winged elm, gum bumelia, sugar hackberry, boxelder, possumhaw, honeylocust, and Osage orange. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as field brome, Bermudagrass, little barley, cheatgrass, western ragweed, Virginia wildrye, and sedge species.

Southeastern Great Plains: Riparian Barrens

Area: 3,137 acres (1,269 ha)

Description of Mapped Type: These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands and stream edges.

Southeastern Great Plains: Riparian Barrens
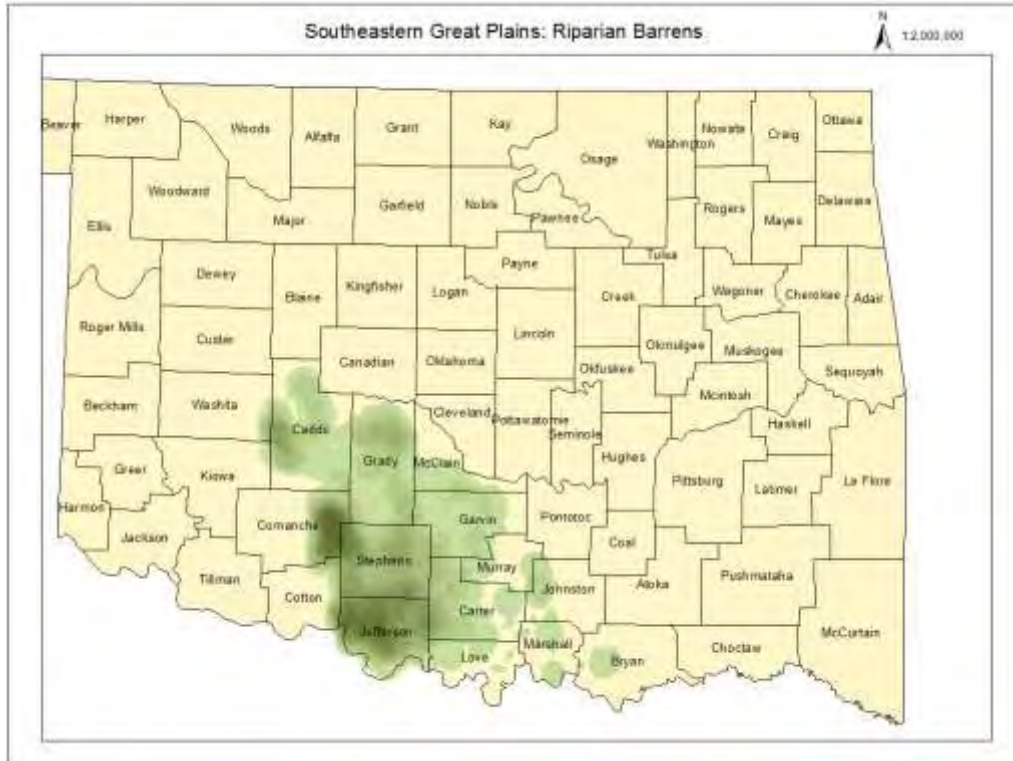
Southeastern Great Plains: Riparian Eastern Redcedar Woodland and Shrubland

Area: 5,321 acres (2,153 ha)

Description of Mapped Type: This type is mapped on bottomland soils and circumscribes areas where eastern redcedar is the prevailing dominant. Other components may include species such as green ash, gum bumelia, Osage orange, honeylocust, western soapberry, hackberry species, willow species, and elm species.

Southeastern Great Plains: Riparian Eastern Redcedar Woodland and Shrubland

Southeastern Great Plains: Riparian Hardwood Woodland

Area: 97,890 acres (39,615 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. The corridors may be dominated by species such as sugar hackberry, black willow, pecan, slippery elm, green ash, post oak, sycamore, plains cottonwood, green ash, boxelder, Osage orange, or western soapberry.
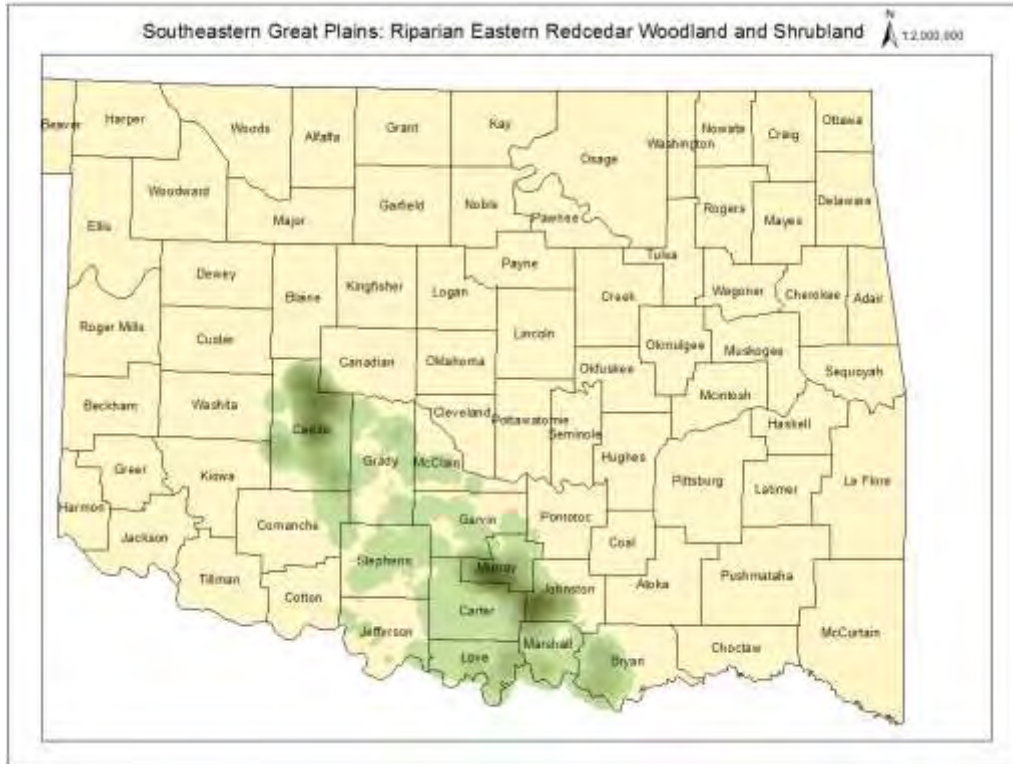
Southeastern Great Plains: Riparian Herbaceous Wetland

Area: 828 acres (335 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.

Southeastern Great Plains: Riparian Herbaceous Wetland
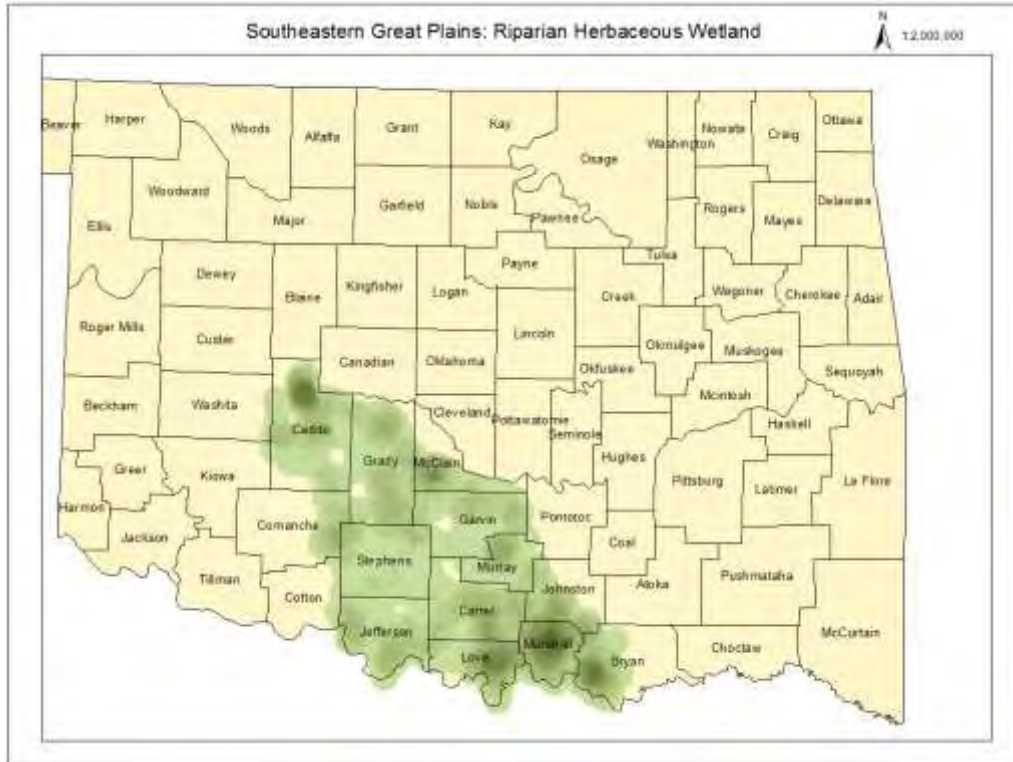
Southeastern Great Plains: Riparian Mixed Evergreen – Hardwood Woodland

Area: 2,897 acres (1,172 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers where eastern redcedar is among the most important species. Other components may include species such as green ash, gum bumelia, possumhaw, honeylocust, hackberry species, black walnut, willow species, Osage orange, and elm species.

Southeastern Great Plains: Riparian Shrubland and Young Woodland

Area: 10,589 acres (4,285 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common shrubs or small trees include willow species, common buttonbush, green ash, winged elm, gum bumelia, sugar hackberry, boxelder, possumhaw, honeylocust, and Osage orange. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as field brome, Bermudagrass, little barley, cheatgrass, western ragweed, Virginia wildrye, and sedge species.

Urban High Intensity

Area: 52,779 acres (21,359 ha)

Description of Mapped Type: This type consists of built-up areas and wide transportation corridors that are dominated by impervious cover.

Urban Low Intensity

<u>Area</u>: 1,208,759 acres (488,168 ha)

<u>Description of Mapped Type:</u> This type includes areas that are built-up or partially cleared of vegetation but not entirely covered by impervious cover, and includes most of the non-industrial areas within cities and towns.

West Gulf Coastal Plain: Dry Upland Hardwood Forest

Area: 223,039 acres (90,261 ha)

Description of Mapped Type: This type circumscribes forests that are mainly in a variety of states of recovery from human disturbance, and over a variety of soil moisture regimes. Common species may include white oak, southern red oak, post oak, water oak, sweetgum, hickory species, sugar hackberry, elm species, and green ash. Loblolly or shortleaf pine may be a component.

West Gulf Coastal Plain: Large River Bottomland Barrens

Area: 6,499 acres (2,630 ha)

Description of Mapped Type: These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands, riverbeds, and stream edges.
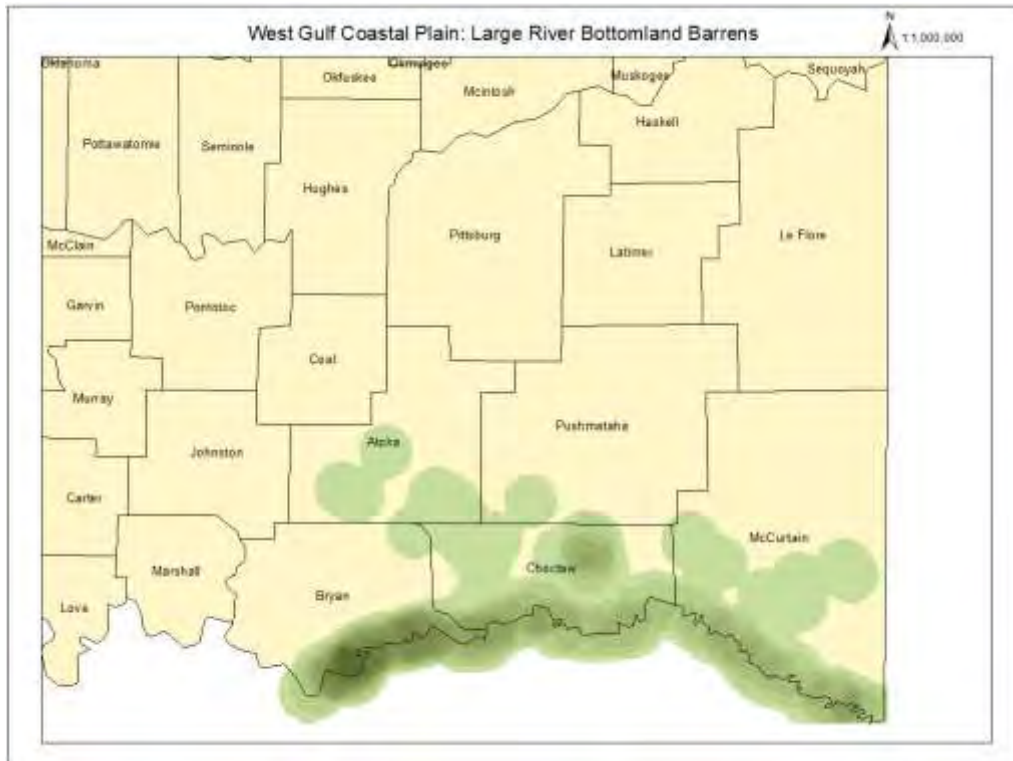
West Gulf Coastal Plain: Large River Bottomland Deciduous Shrubland

Area: 7,904 acres (3,199 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. They generally represent successional pastures or woodland edges that could not be confirmed as clear-cuts based on data from 2000 to 2012. Common species may include winged elm, common buttonbush, green ash, sugar hackberry, green ash, honeylocust, baccharis species, and possumhaw.
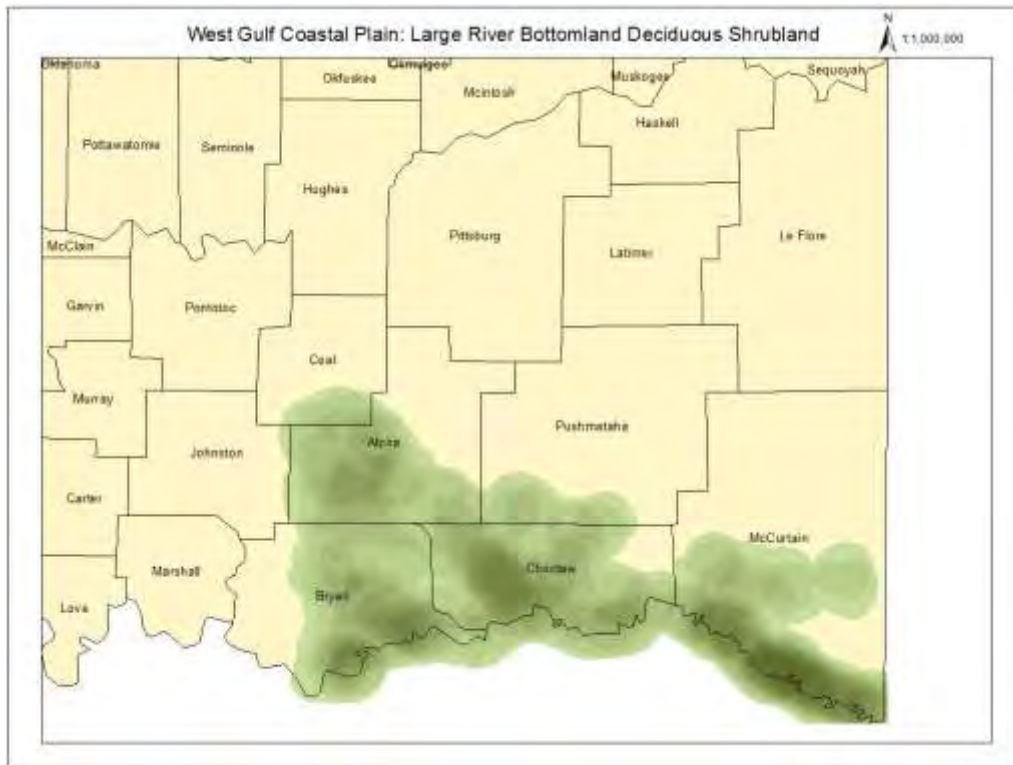
West Gulf Coastal Plain: Large River Bottomland Evergreen Woodland and Shrubland

Area: 2,485 acres (1,005 ha)

Description of Mapped Type: This type is mapped on bottomland soils where loblolly pine is the prevailing dominant. These stands are commonly the result of past timber management, but these areas could not be identified as former clear-cuts based on satellite remote sensing data from 2000 to 2012. Common associated trees include sweetgum, water oak, ash species, and elm species.

West Gulf Coastal Plain: Large River Bottomland Evergreen Woodland and Shrubland

West Gulf Coastal Plain: Large River Bottomland Hardwood Forest

<u>Area</u>: 179,673 acres (72,711 ha)

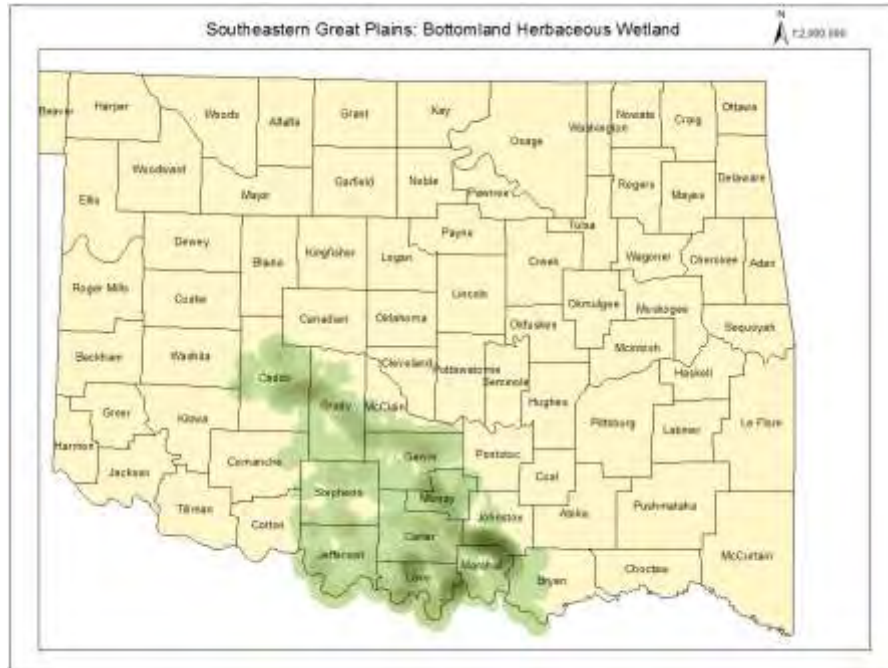<u>Description of Mapped Type:</u> This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common overstory trees may include water oak, pecan, willow oak, sugar hackberry, post oak, sweetgum, green ash, blackgum, slippery elm, American elm, sycamore, and black willow. Shrubs such as common buttonbush and river birch may occur in well-watered areas.
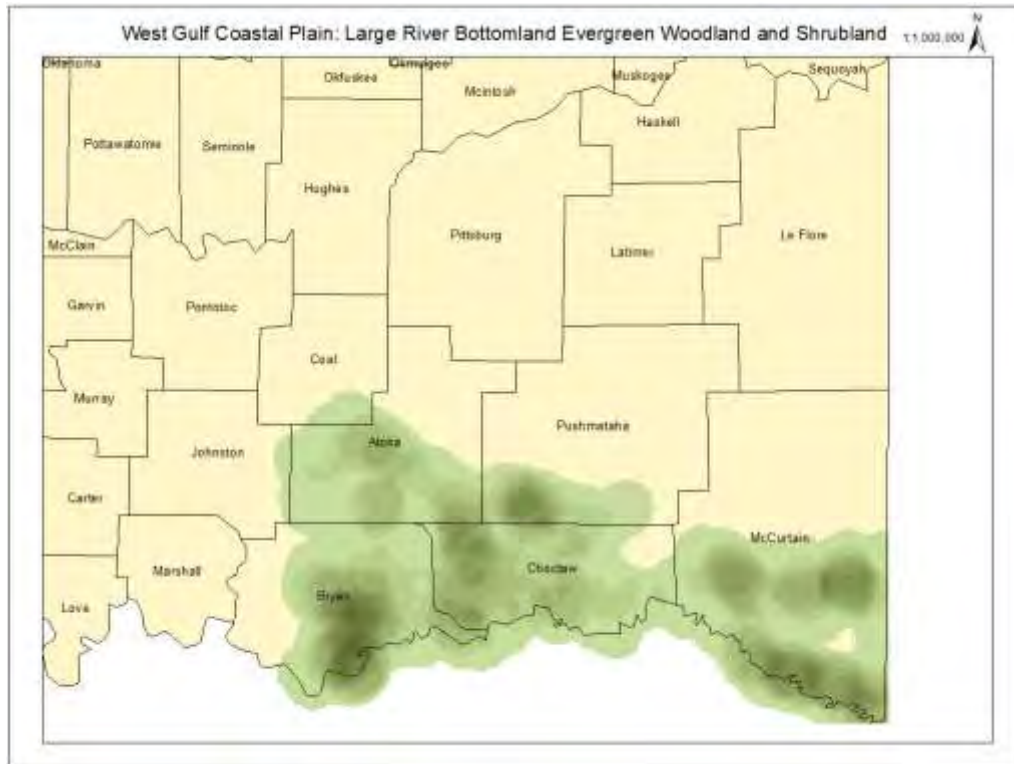
West Gulf Coastal Plain: Large River Bottomland Herbaceous Wetland

Area: 9,672 acres (3,914 ha)

Description of Mapped Type: This type is mapped on bottomland soils across a variety of hydrologic regimes and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.

West Gulf Coastal Plain: Large River Bottomland Mixed Hardwood-Evergreen Forest

Area: 44,348 acres (17,947 ha)

Description of Mapped Type: This type is mapped on bottomland soils where loblolly pine is among the most important species. These stands may be the result of past timber management, but these areas could not be identified as former clear-cuts based on satellite remote sensing data from 2000 to 2012. Common associated trees include sweetgum, water oak, ash species, and elm species.

West Gulf Coastal Plain: Large River Bottomland Mixed Hardwood - Evergreen Forest

West Gulf Coastal Plain: Large River Bottomland Seasonally Flooded Hardwood Forest

Area: 65,479 acres (26,498 ha)

Description of Mapped Type: This type includes areas that are seasonally or temporarily flooded. Common overstory species include willow oak, water oak, water hickory, American elm, slippery elm, sweetgum, and sugar hackberry. In the wettest areas of southeast Oklahoma, species such as baldcypress, overcup oak, river birch, common buttonbush, and planer tree may occur in restricted areas.

West Gulf Coastal Plain: Northern Calcareous Prairie/Pasture

<u>Area</u>: 35,434 acres (14,340 ha)

<u>Description of Mapped Type:</u> This type is mainly represented by grazed pastures with non-native and grazing-tolerant species in the modern landscape. Common species may include Bermudagrass, prairie broomweed, field brome, western (Cuman) ragweed, and Johnsongrass. Woody species such as winged elm, sumac species, possumhaw, and sugar hackberry may be present.

West Gulf Coast Plain: Northern Calcareous Prairie/Pasture
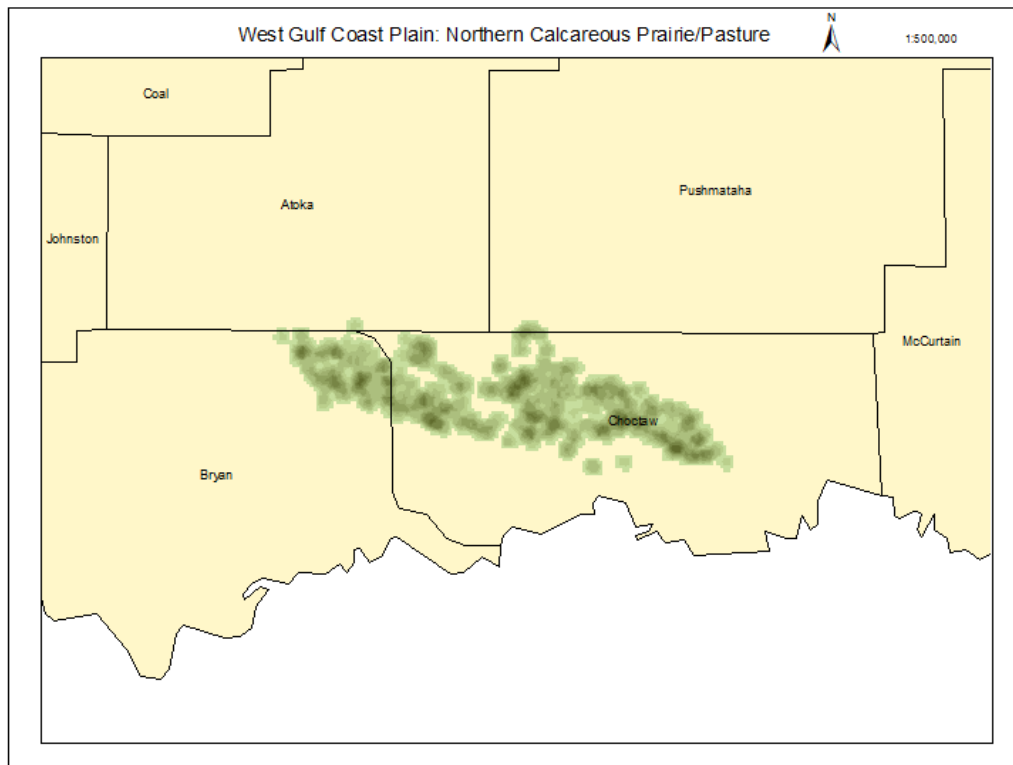
West Gulf Coastal Plain: Pasture

Area: 403,877 acres (163,443 ha)

Description of Mapped Type: This type is mainly represented by grazed pastures with non-native and grazing-tolerant species in the modern landscape. Common species may include Bermudagrass, little bluestem, prairie broomweed, prairie tea, tall fescue, field brome, and Johnsongrass. Woody species may include winged elm, sugar hackberry, possumhaw, green ash, and eastern redcedar.
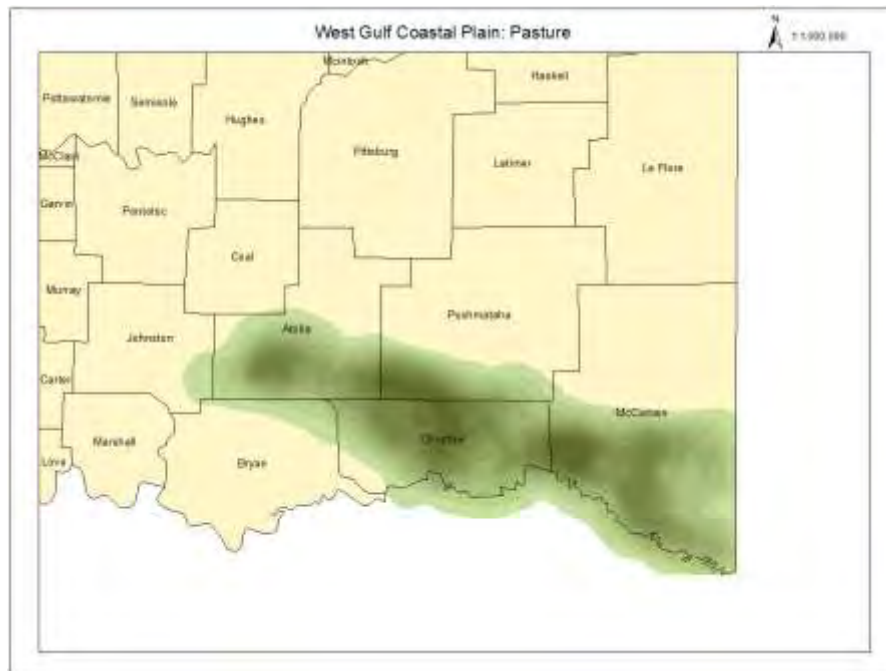
West Gulf Coastal Plain: Pine - Hardwood Forest

Area: 46,870 acres (18,968 ha)

Description of Mapped Type: This type mainly represents areas that are in recovery from past timber management in the modern landscape, but could not be identified as plantations based on data from 2000 - 2012. Loblolly, or less commonly, shortleaf pines are a major component, together with species such as white oak, southern red oak, post oak, hickory species, water oak, sweetgum, and sugar hackberry. Common understory species include farkleberry, American beautyberry, flowering dogwood, and hophornbeam.
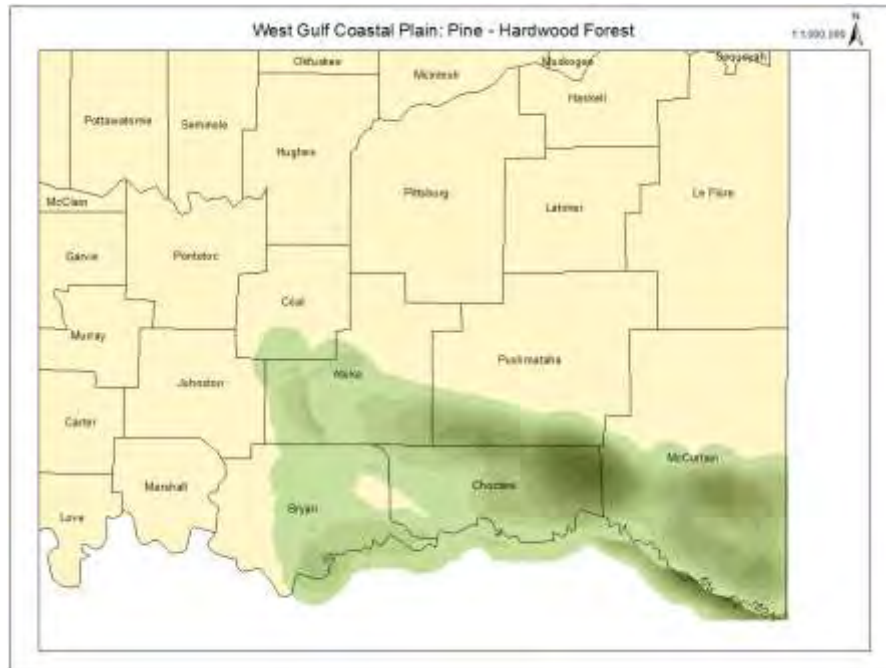
West Gulf Coastal Plain: Pine Forest

Area: 17,073 acres (6,909 ha)

Description of Mapped Type: In the modern landscape, this type most commonly represents planted loblolly, or less frequently, shortleaf pine stands, but these areas could not be identified as pine plantations based on data from 2000 - 2012. Stands were relatively mature at the time of data acquisition (circa 2012). Pines are overwhelmingly dominant, and trees such as white oak, southern red oak, sweetgum, water oak, and sugar hackberry may be present.

West Gulf Coastal Plain: Pine Forest
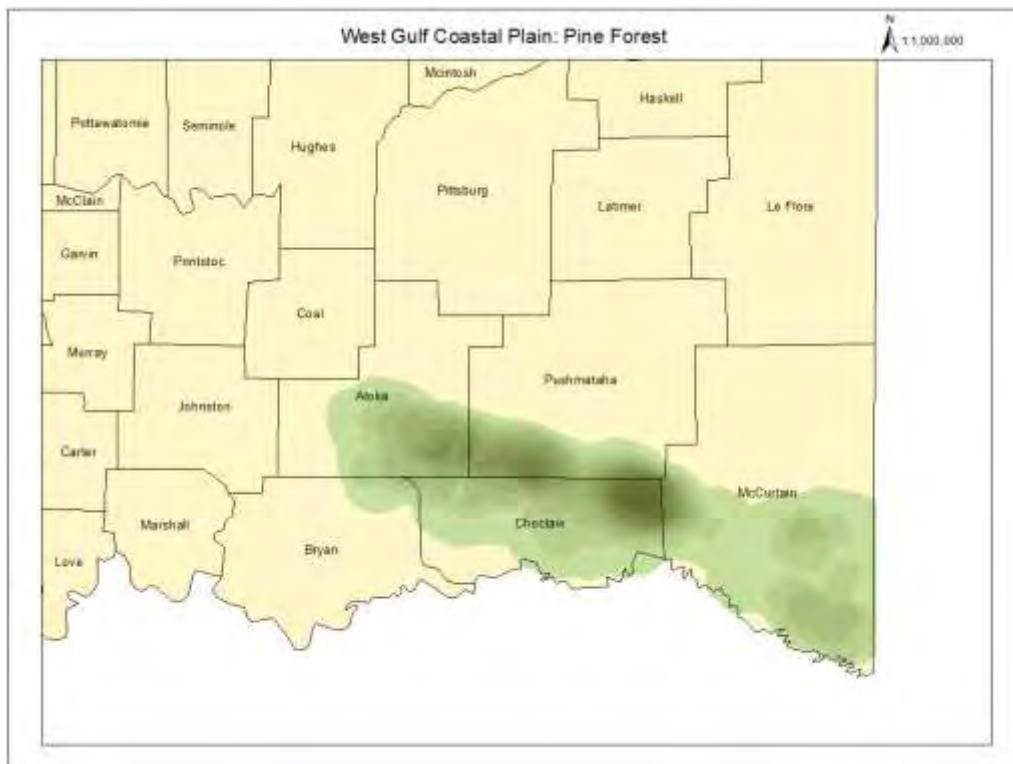
West Gulf Coastal Plain: Sandhill Oak Woodland

Area: 5,459 acres (2,209 ha)

Description of Mapped Type: This type is mapped over more or less deep sands and common trees include post oak, blackjack oak, water oak, southern red oak, and hickory species. Shortleaf pine may also be a component. On the deepest sands, bluejack oak may be a component, and open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.

West Gulf Coastal Plain: Sandhill Oak Woodland
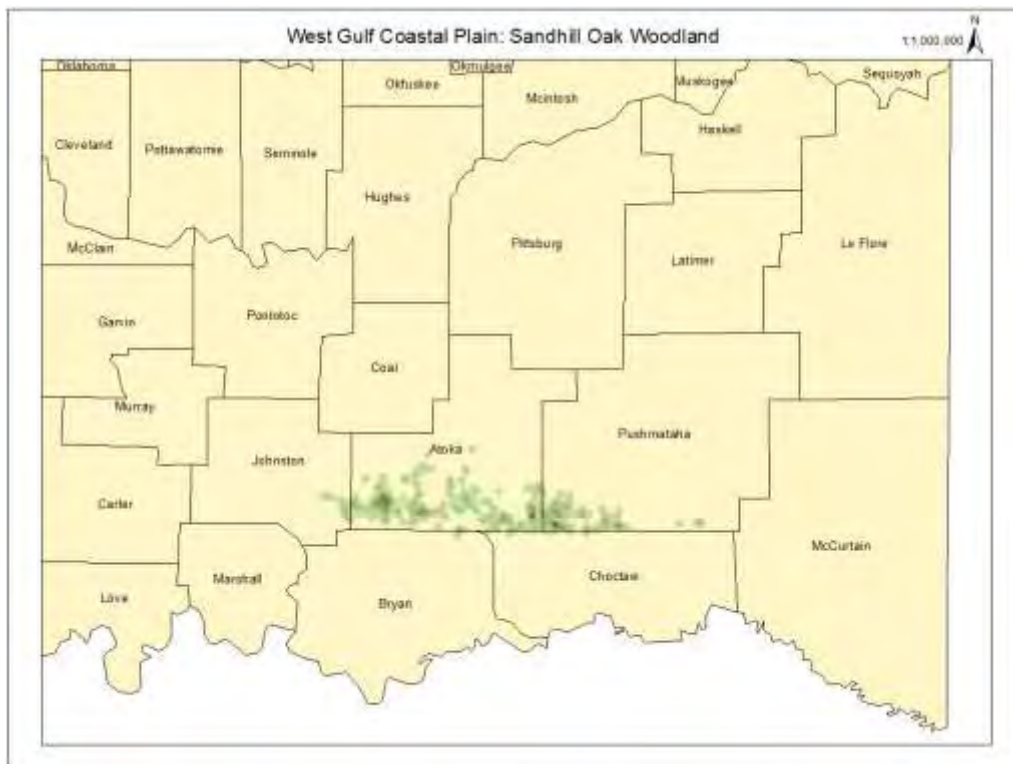
West Gulf Coastal Plain: Sandhill Shortleaf Pine Woodland

Area: 181 acres (73 ha)

Description of Mapped Type: This type is mapped over more or less deep sands and shortleaf pine is a primary overstory component. Other trees may include post oak, blackjack oak, water oak, southern red oak, and hickory species. On the deepest sands, bluejack oak may be a component, and open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.


West Gulf Coastal Plain: Sandhill Shortleaf Pine Woodland

West Gulf Coastal Plain: Small Stream Barrens

Area: 46 acres (19 ha)

Description of Mapped Type: These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands and stream edges.

West Gulf Coastal Plain: Small Stream Deciduous Shrubland

Area: 1,823 acres (738 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and commonly represents successional shrublands or young woodlands in pastures. These areas could not be confirmed as clear-cuts based on data from 2000 to 2012. Common species may include winged elm, sugar hackberry, honeylocust, baccharis species, and possumhaw. Species such as common buttonbush and river birch may occur near stream edges.
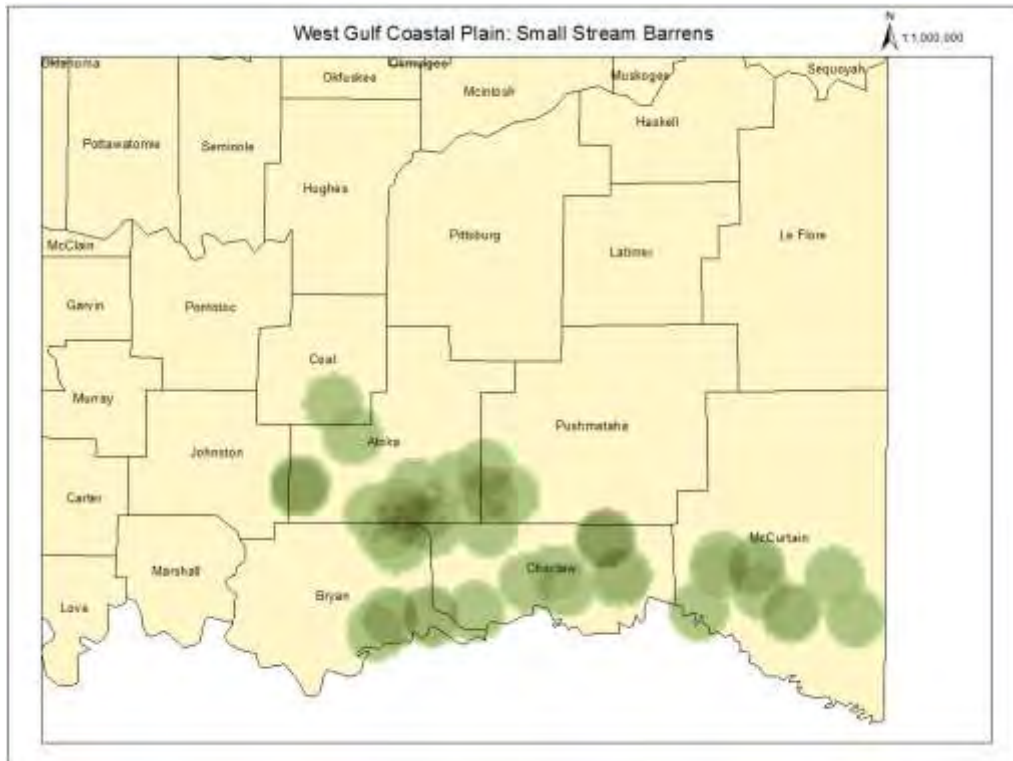
West Gulf Coastal Plain: Small Stream Evergreen Woodland and Shrubland

Area: 1,650 acres (668 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers where loblolly pine is the prevailing dominant. These stands are commonly the result of past timber management, but these areas could not be identified as former clear-cuts based on satellite remote sensing data from 2000 to 2012. Common associated trees include sweetgum, water oak, ash species, and elm species.
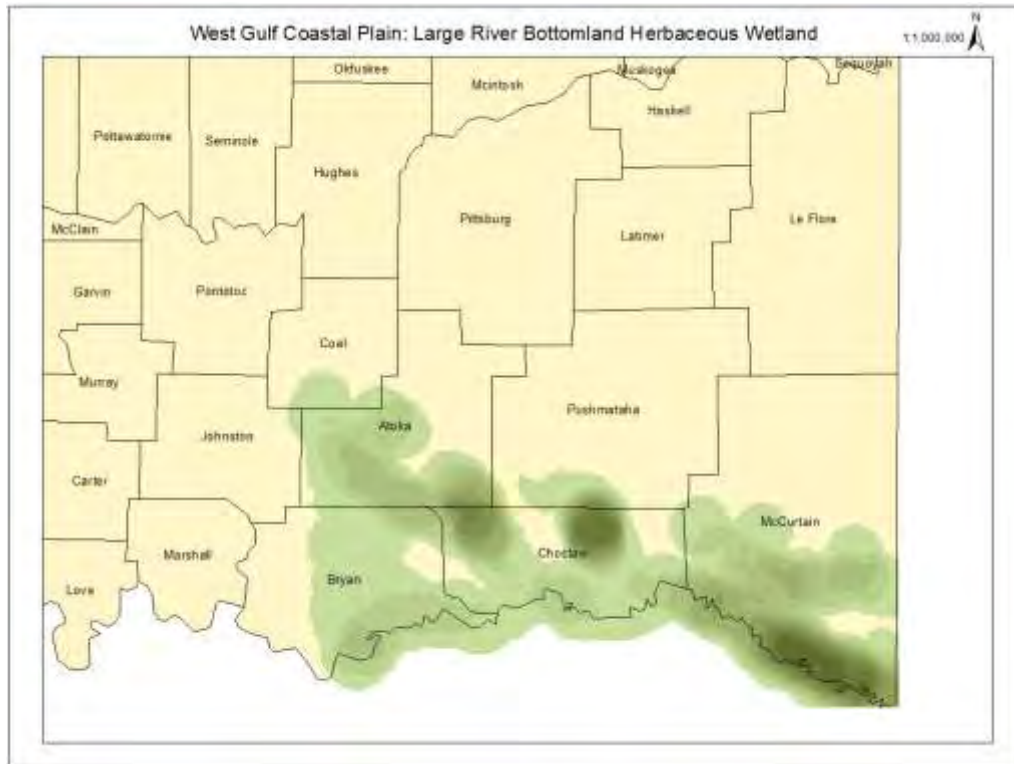
West Gulf Coastal Plain: Small Stream Hardwood Woodland

Area: 33,139 acres (13,411 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common overstory trees may include water oak, pecan, willow oak, sugar hackberry, post oak, sweetgum, green ash, blackgum, slippery elm, American elm, sycamore, and black willow. Shrubs such as buttonbush and river birch may occur in well-watered areas.
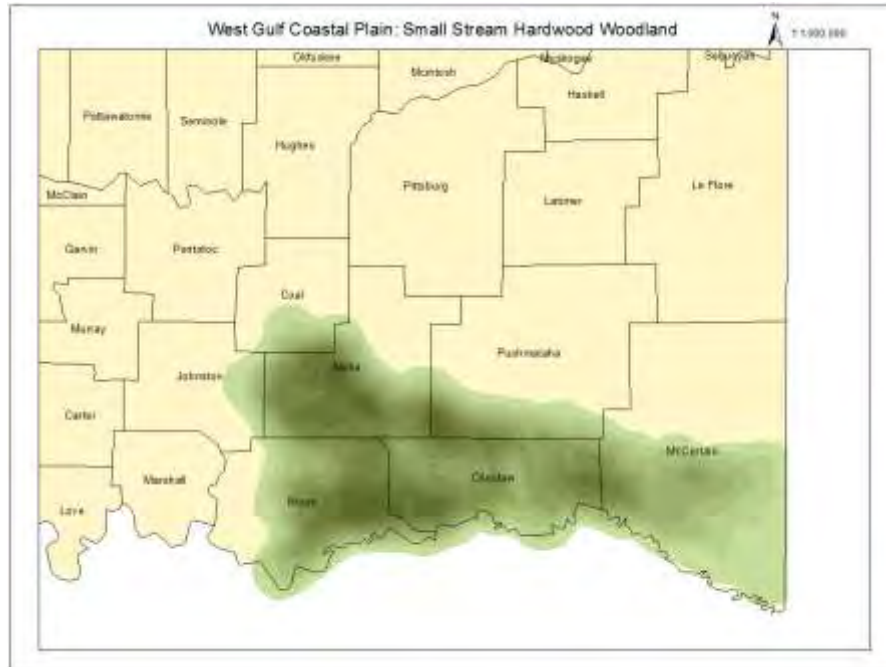
West Gulf Coastal Plain: Small Stream Herbaceous Wetland

Area: 339 acres (137 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers, and may be represented by a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.


West Gulf Coastal Plain: Small Stream Herbaceous Wetland
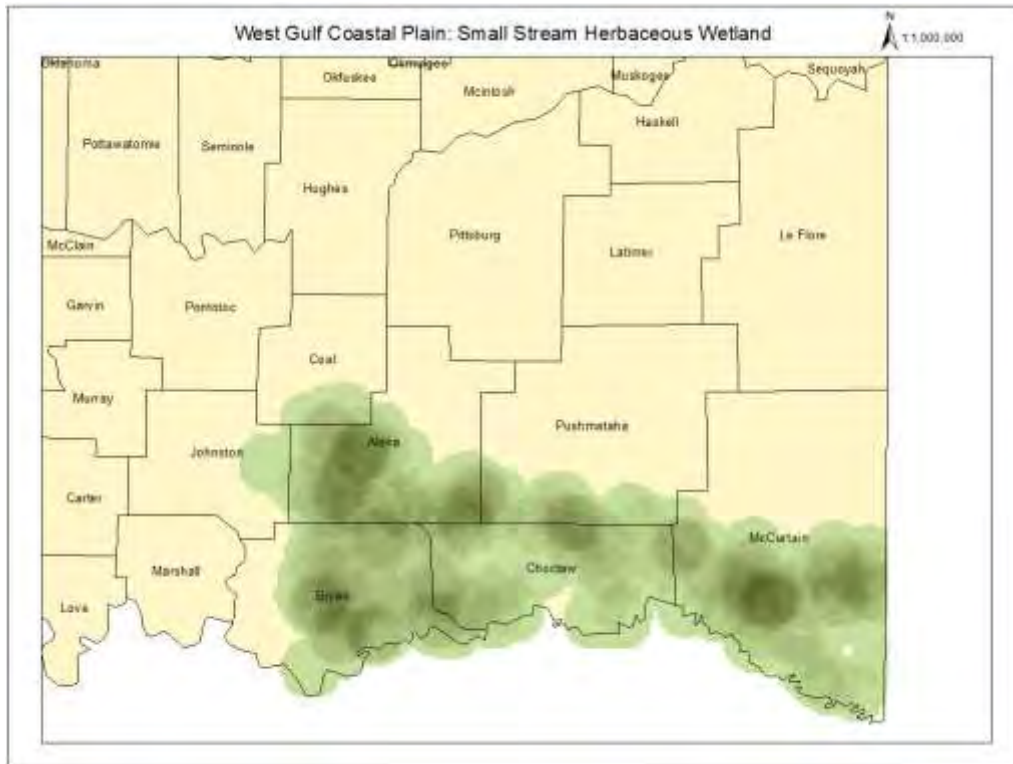
West Gulf Coastal Plain: Small Stream Mixed Pine - Hardwood Woodland

Area: 4,385 acres (1,775 ha)

Description of Mapped Type: This type is mapped along first and second order streams within narrow buffers where loblolly pine is among the most important species. These stands are commonly the result of past timber management, but these areas could not be identified as former clear-cuts based on satellite remote sensing data from 2000 to 2012. Common associated trees include sweetgum, water oak, ash species, and elm species. Eastern redcedar may also be an important component.

West Gulf Coastal Plain: Small Stream Mixed Pine - Hardwood Woodland
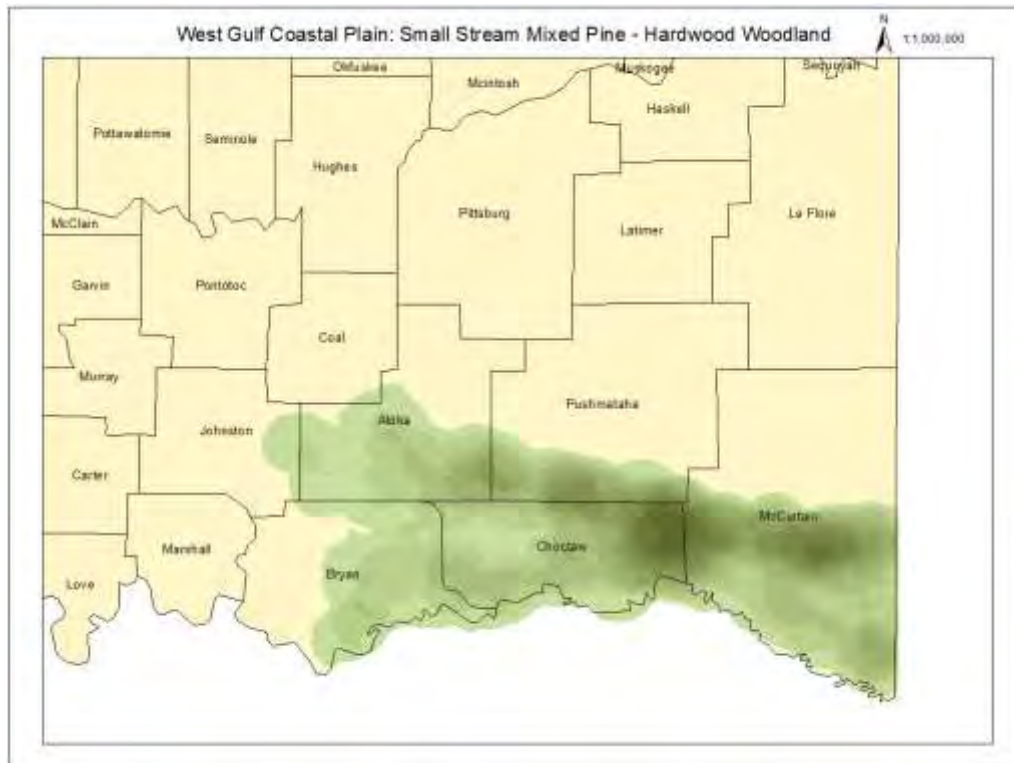
West Gulf Coastal Plain: Small Stream Seasonally Flooded Hardwood Woodland

Area: 5,663 acres (2,292 ha)

Description of Mapped Type: This type includes areas that are seasonally or temporarily flooded along narrow stream corridors. Common overstory species include willow oak, water oak, water hickory, American elm, slippery elm, sweetgum, and sugar hackberry.
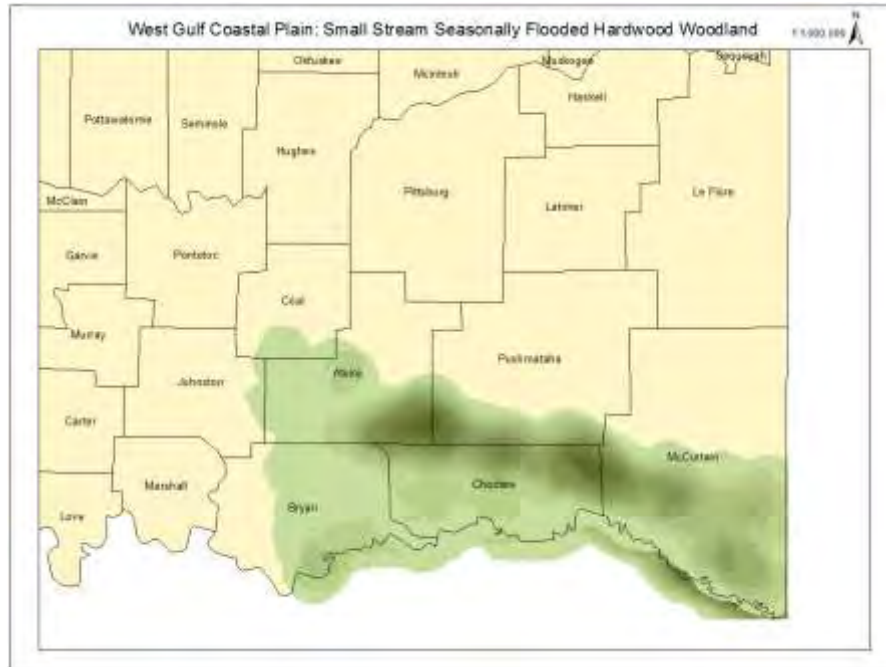
West Gulf Coastal Plains: Young Upland Hardwood Woodland Regrowth

Area: 13,436 acres (5,438 ha)

Description of Mapped Type: This type circumscribes a variety of successional woodlands and shrublands in pastures or on forest edges, but does not include areas that were detected as having been logged between 2000 and 2012. Common species may include winged elm, sumac species, sugar hackberry, sweetgum, common persimmon, possumhaw, green ash, and eastern redcedar. Elements of the West Gulf Coastal Plain: Pasture type may form an herbaceous matrix.

West Gulf Coastal Plains: Young Upland Hardwood Woodland Regrowth
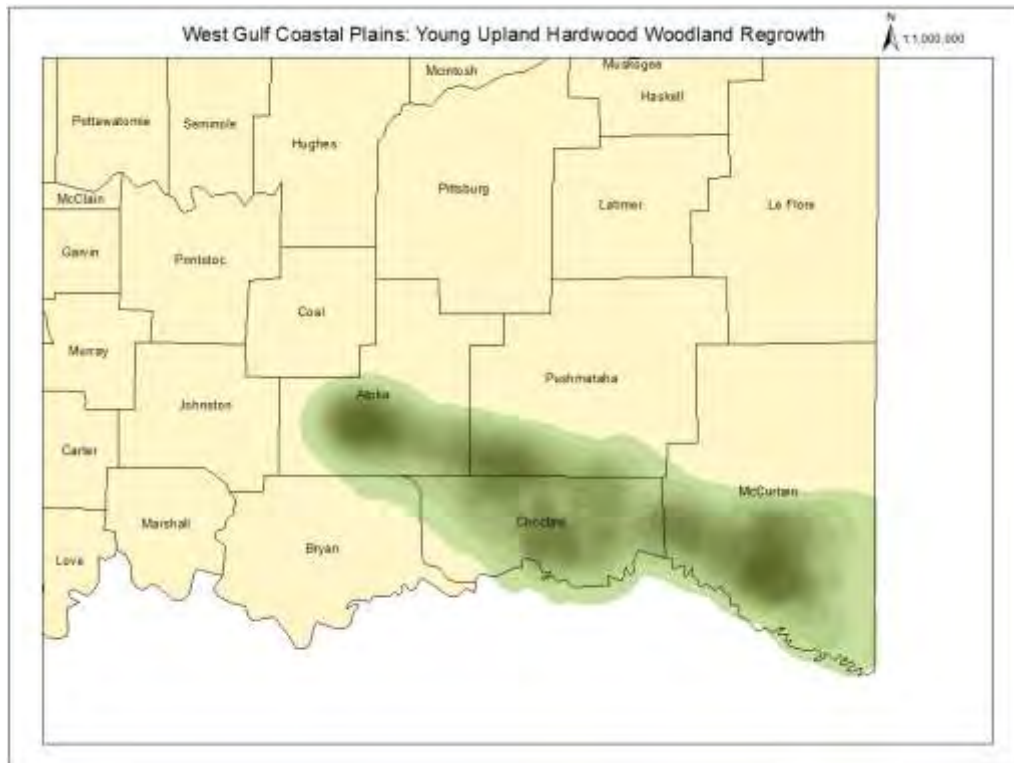
Wichita Mountains: Eastern Redcedar Shrubland

Area: 3,443 acres (1,393 ha)

Description of Mapped Type: This type often occurs in shallow soils or in cracks in igneous granite, rhyolite, or gabbro rocks. Eastern redcedar is the prevailing dominant. The aspect can be patchy with very shallow soils or rocks exposed at the surface. Species such as post oak, blackjack oak, netleaf hackberry, gum bumelia, and little walnut may be present. Little bluestem, tall dropseed, and short grasses such as buffalograss, blue grama, and hairy grama may be important in openings.
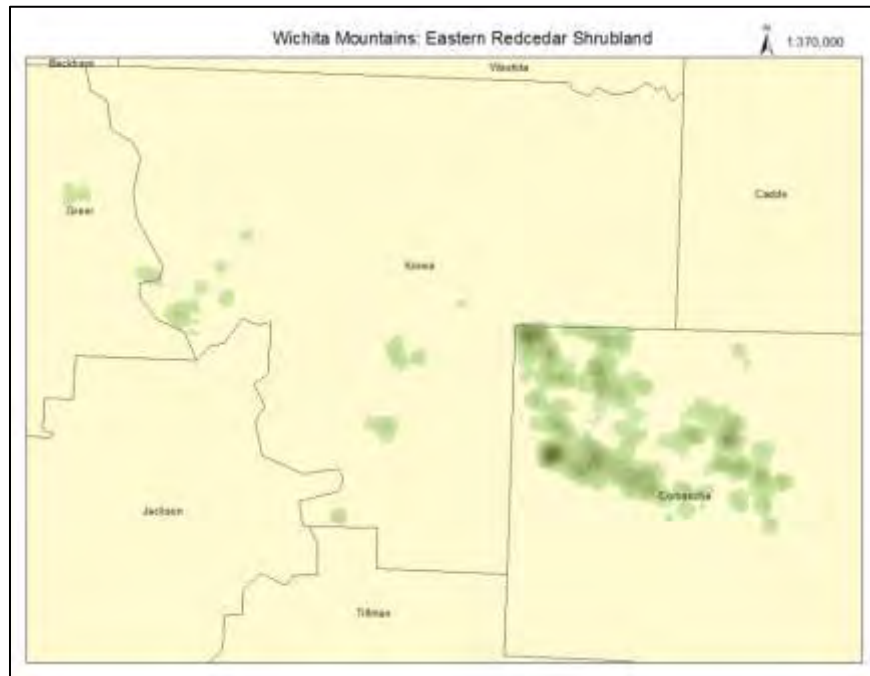
Wichita Mountains: Eastern Redcedar Slope Woodland

Area: 3,365 acres (1,362 ha)

Description of Mapped Type: This type represents eastern redcedar-dominated woodlands on slopes >20%. Common species include netleaf hackberry, post oak, blackjack oak, Shumard oak, bur oak, chinkapin oak, American elm, and gum bumelia.
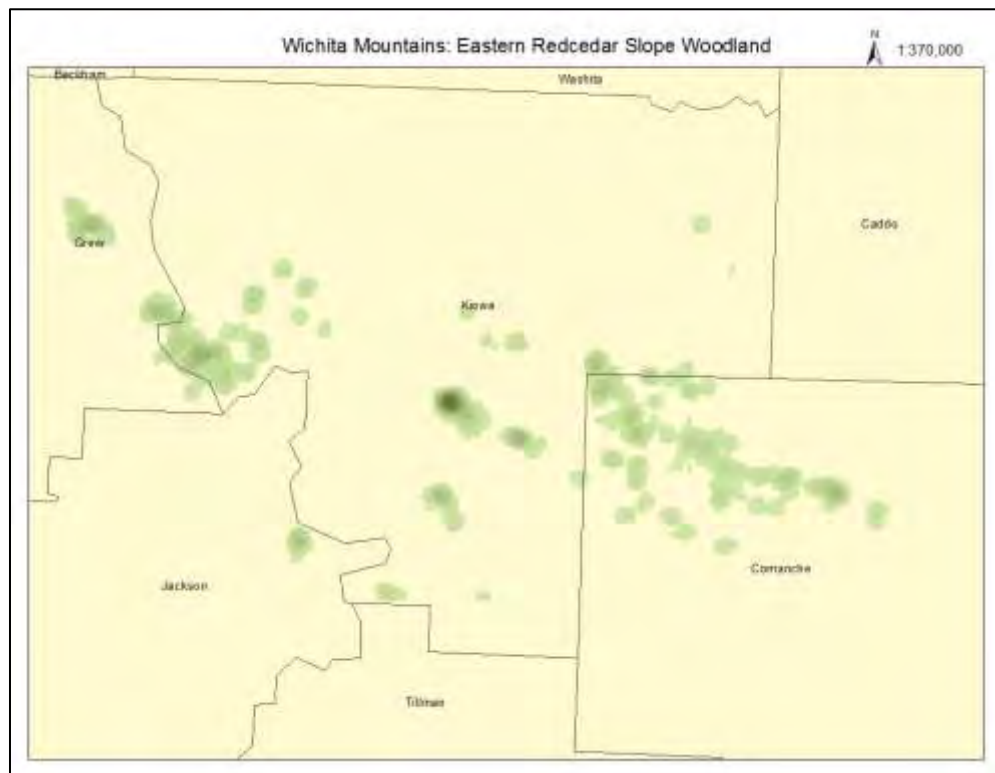
Wichita Mountains: Eastern Redcedar Woodland

Area: 723 acres (293 ha)

Description of Mapped Type: This uncommon type may occur in areas of relatively continuous or discontinuous soils so may be more or less patchy in nature. Eastern redcedar is the common dominant, and species such as post oak, blackjack oak, netleaf hackberry, gum bumelia, and little walnut may be components.
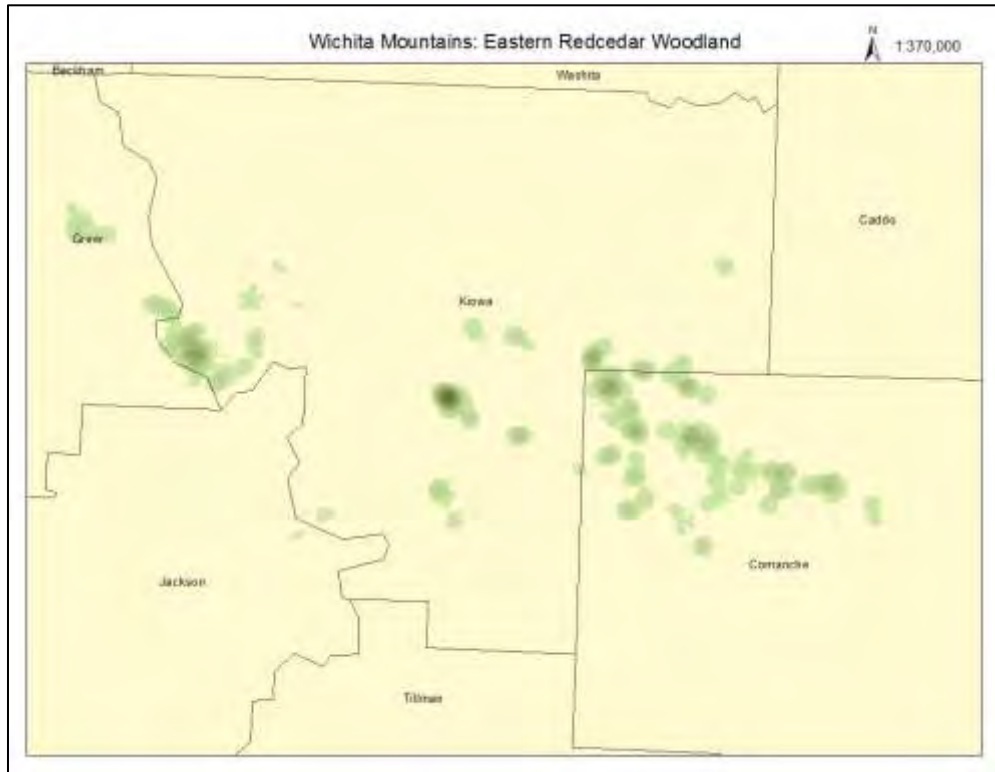
Wichita Mountains: Granite Outcrop

Area: 1,317 acres (533 ha)

Description of Mapped Type: This type includes areas that were essentially barren with exposed igneous rocks in all seasons at the time of data acquisition (circa 2012). Short grasses and annual forbs may be present.
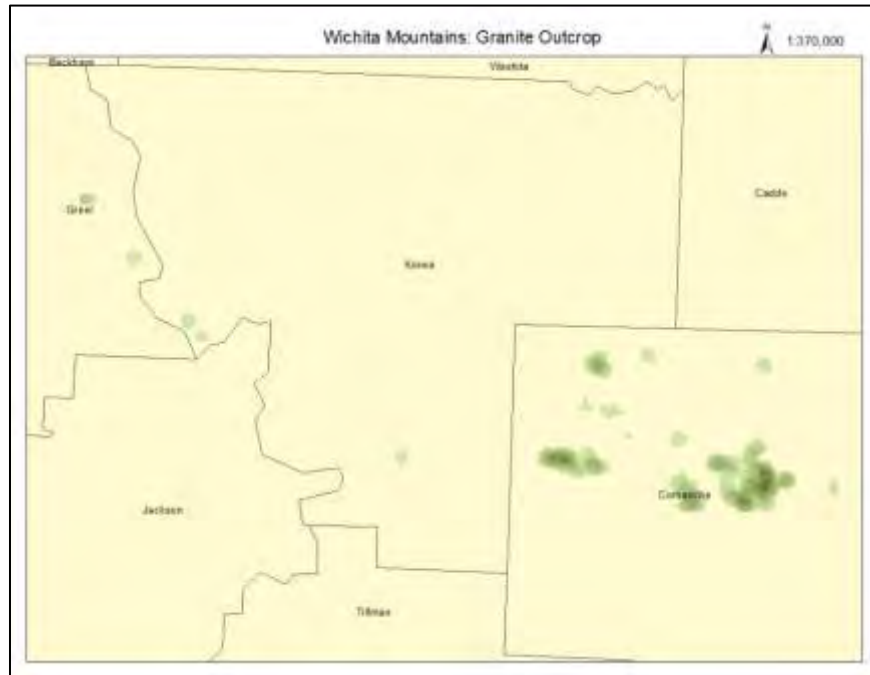
Wichita Mountains: Low Stature Oak Slope Woodland and Shrubland

Area: 13,744 acres (5,562 ha)

Description of Mapped Type: This type is mapped on slopes >20% and composition is similar to the Wichita Mountains: Low Stature Oak Woodland and Shrubland. Stands tend to be more closed with taller individual trees and fewer herbaceous-dominated openings.

Wichita Mountains: Low Stature Oak Slope Woodland and Shrubland
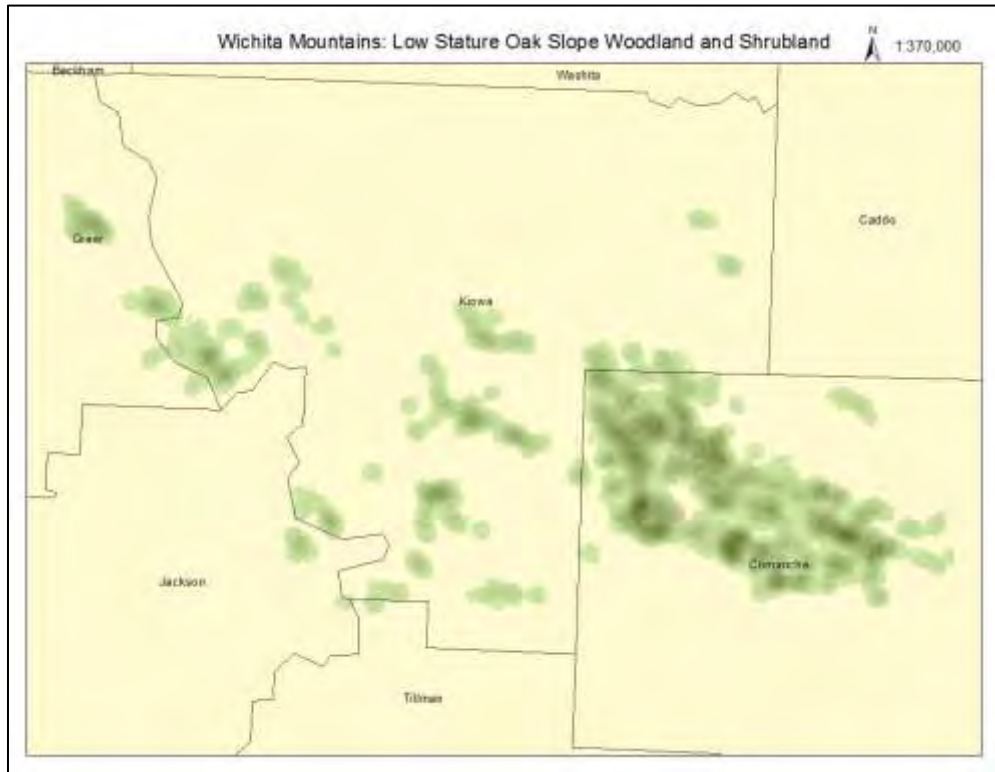
Wichita Mountains: Low Stature Oak Woodland and Shrubland

Area: 14,188 acres (5,742 ha)

Description of Mapped Type: This type often occurs in shallow soils or in cracks in igneous granite, rhyolite, or gabbro rocks. The aspect can be patchy with very shallow soils or rocks exposed at the surface. Post oak is the most common dominant, and species such as blackjack oak, netleaf hackberry, gum bumelia, and little walnut may be present. Little bluestem, tall dropseed, and short grasses such as buffalograss, blue grama, and hairy grama may be important in openings.
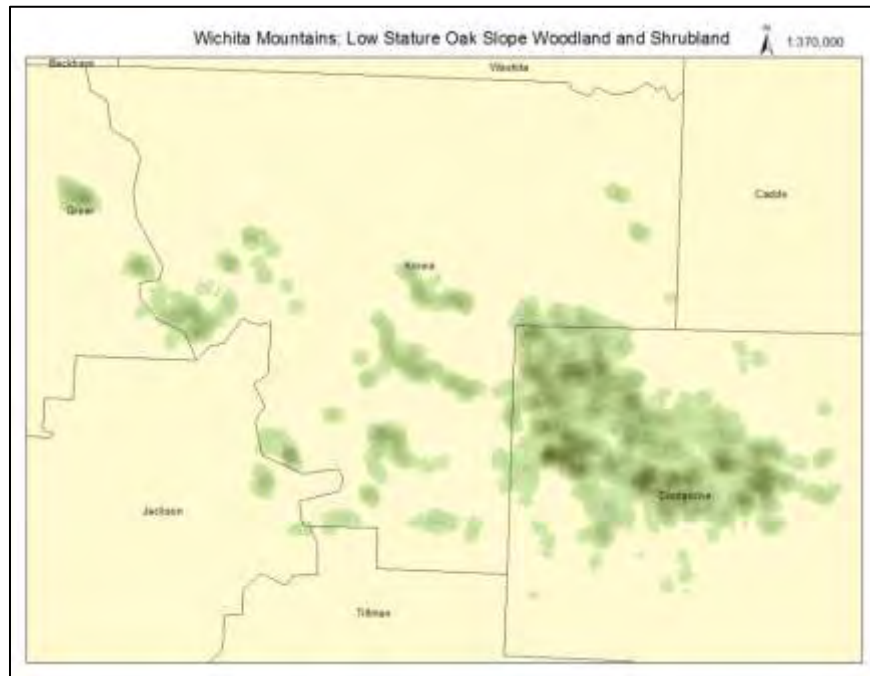
Wichita Mountains: Oak – Eastern Redcedar Slope Woodland

Area: 427 acres (173 ha)

Description of Mapped Type: This uncommon type contains eastern redcedar among the dominants, together with species such as post oak, blackjack oak, chinkapin oak, gum bumelia, netleaf hackberry, and little walnut.
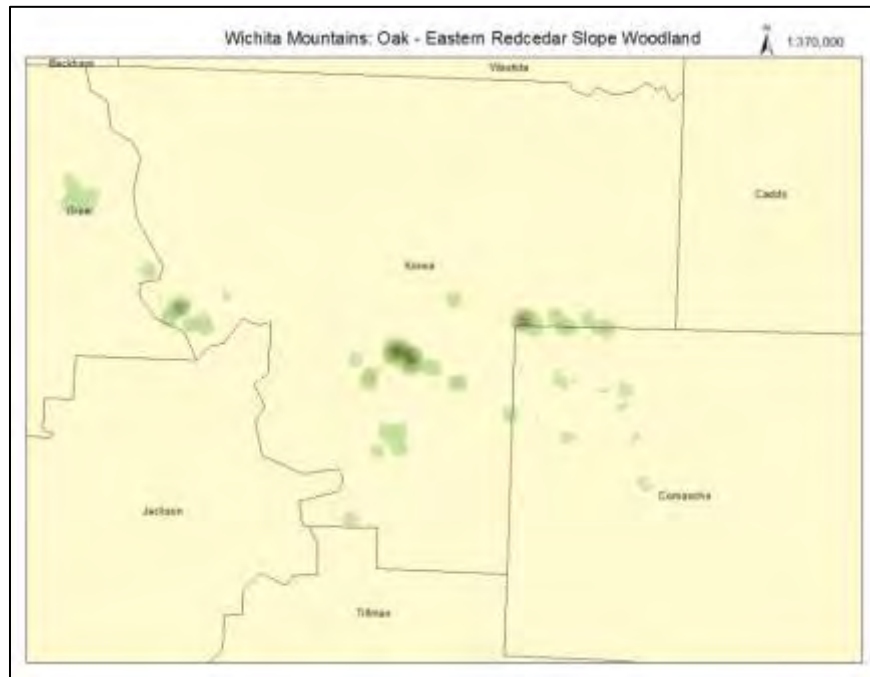
Wichita Mountains: Oak - Eastern Redcedar Woodland

Area: 281 acres (114 ha)

Description of Mapped Type: This uncommon type contains eastern redcedar among the dominants, together with species such as post oak, blackjack oak, chinkapin oak, gum bumelia, netleaf hackberry, and little walnut.
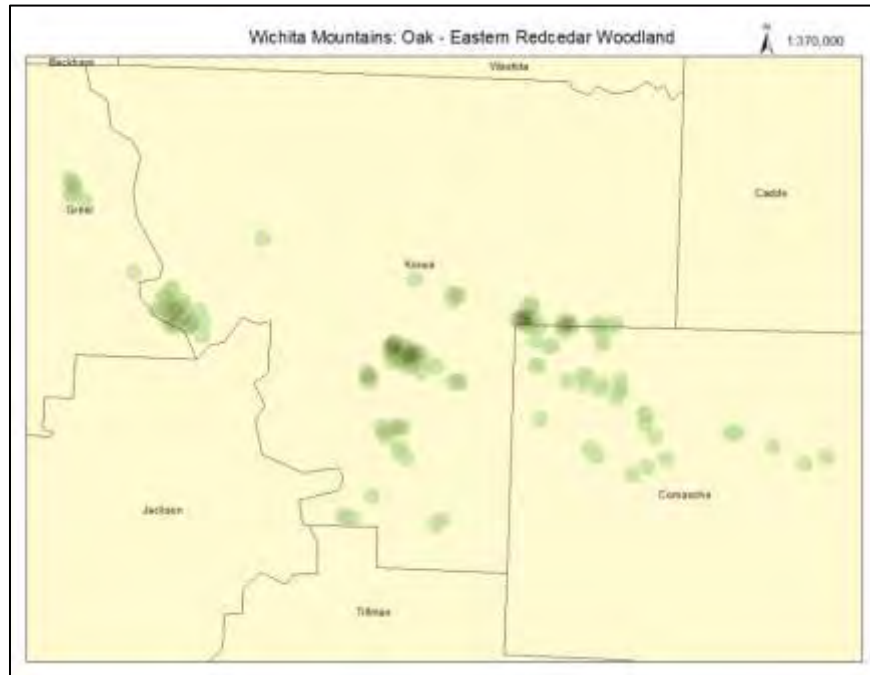
Wichita Mountains: Oak Slope Woodland

Area: 11,478 acres (4,645 ha)

Description of Mapped Type: This type is mapped on slopes >20% and composition is similar to the Wichita Mountains: Oak - Eastern Redcedar Woodland type. Stands tend to be more closed with taller individual trees and fewer herbaceous-dominated openings.
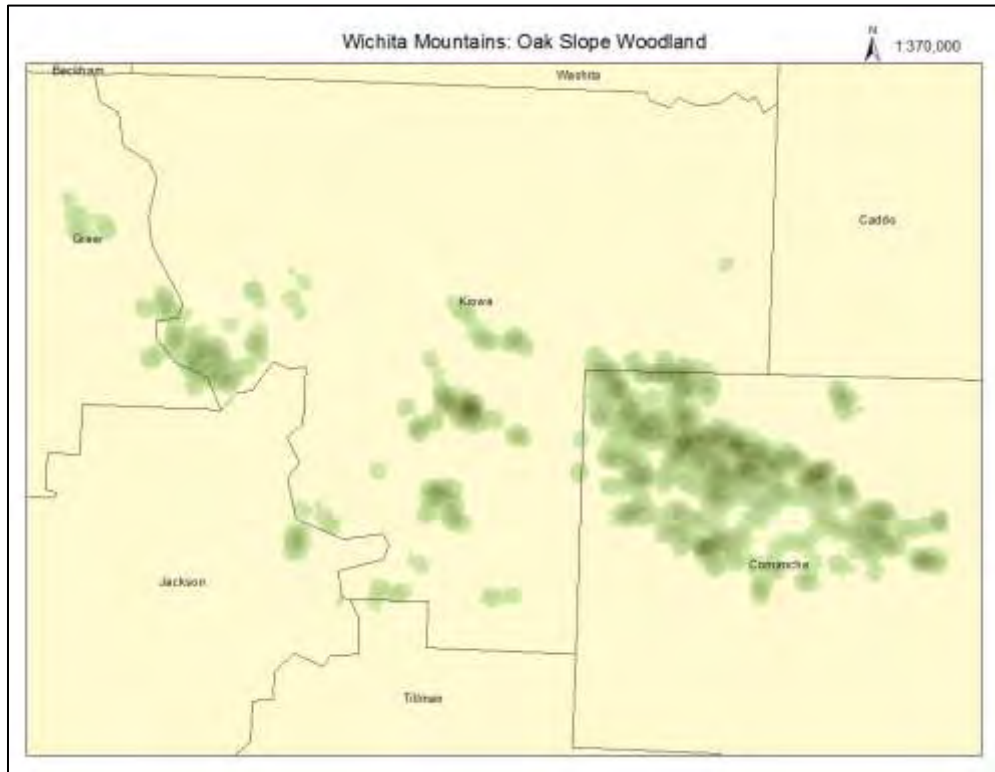
Wichita Mountains: Oak Woodland

Area: 17,168 acres (6,948 ha)

Description of Mapped Type: This type most often occurs over relatively continuous soils with few openings, and is represented in a variety of land positions. Post oak is the most common dominant, followed by blackjack oak. Western occurrences may have netleaf hackberry replacing post oak as the dominant. Other species may include chinkapin oak, netleaf hackberry, gum bumelia, and little walnut. Species such as bur oak, American elm, pecan, and sugar maple may occur in more mesic areas.
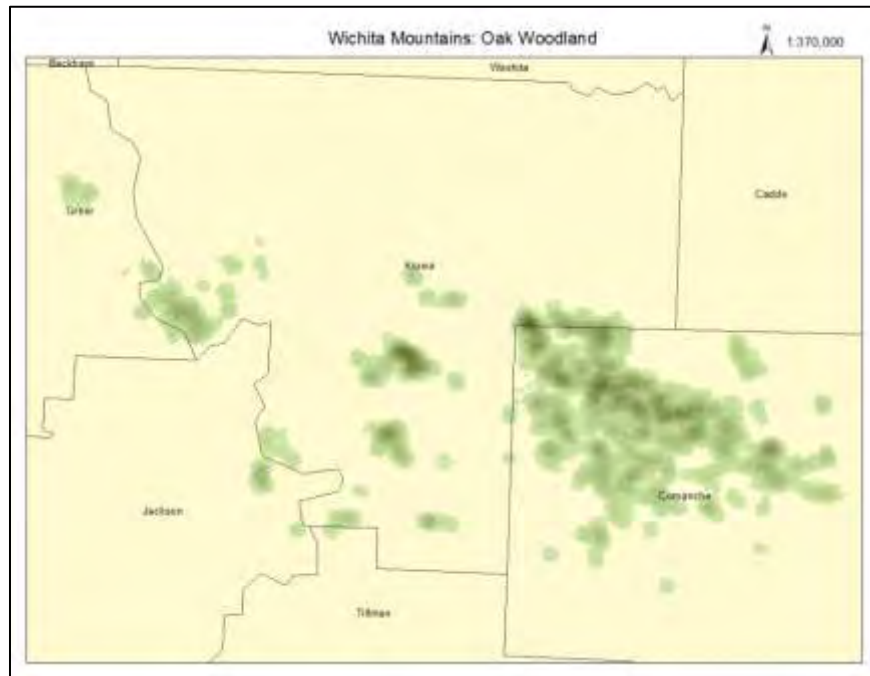
Appendix 1: List of Species Encountered in Plots by Layer

Species	Stratum	# of plots	percent of plots
Quercus stellata	Tree	618	16.662%
Quercus marilandica	Tree	379	10.218%
Carya illinoinensis	Tree	361	9.733%
Celtis laevigata	Tree	332	8.951%
Carya texana	Tree	235	6.336%
Juniperus virginiana	Tree	219	5.905%
Ulmus rubra	Tree	205	5.527%
Fraxinus pennsylvanica	Tree	191	5.150%
Quercus velutina	Tree	156	4.206%
Ulmus alata	Tree	156	4.206%
Populus deltoides	Tree	149	4.017%
Ulmus americana	Tree	147	3.963%
Ulmus pumila	Tree	133	3.586%
Quercus shumardii	Tree	132	3.559%
Platanus occidentalis	Tree	128	3.451%
Salix nigra	Tree	123	3.316%
Pinus echinata	Tree	114	3.074%
Quercus macrocarpa	Tree	109	2.939%
Maclura pomifera	Tree	101	2.723%
Carya alba	Tree	94	2.534%
Quercus muehlenbergii	Tree	90	2.427%
Gleditsia triacanthos	Tree	83	2.238%
Quercus alba	Tree	83	2.238%
Juglans nigra	Tree	80	2.157%
Quercus rubra	Tree	64	1.726%
Acer negundo	Tree	60	1.618%
Sapindus saponaria	Tree	60	1.618%
Prosopis glandulosa	Tree	57	1.537%
Celtis laevigata var. reticulata	Tree	38	1.025%
Carya cordiformis	Tree	36	0.971%
Diospyros virginiana	Tree	36	0.971%
Fraxinus americana	Tree	34	0.917%
Robinia pseudoacacia	Tree	33	0.890%
Liquidambar styraciflua	Tree	32	0.863%
Quercus nigra	Tree	31	0.836%
Quercus falcata	Tree	30	0.809%
Sideroxylon lanuginosum	Tree	28	0.755%

Species	Stratum	# of plots	percent of plots
Celtis occidentalis	Tree	26	0.701%
Juniperus pinchotii	Tree	18	0.485%
Quercus havardii	Tree	18	0.485%
Acer saccharum	Tree	15	0.404%
Betula nigra	Tree	15	0.404%
Acer rubrum	Tree	14	0.377%
Quercus phellos	Tree	14	0.377%
Pinus taeda	Tree	13	0.350%
Juniperus monosperma	Tree	11	0.297%
Acer saccharinum	Tree	10	0.270%
Juniperus ashei	Tree	10	0.270%
Salix exigua	Tree	10	0.270%
Gymnocladus dioicus	Tree	9	0.243%
Carya ovata	Tree	8	0.216%
Cercis canadensis	Tree	8	0.216%
Quercus palustris	Tree	8	0.216%
Morus alba	Tree	7	0.189%
Pinus edulis	Tree	7	0.189%
Tamarix chinensis	Tree	7	0.189%
Quercus buckleyi	Tree	5	0.135%
Morus rubra	Tree	4	0.108%
Nyssa sylvatica	Tree	4	0.108%
Quercus fusiformis	Tree	4	0.108%
Sapindus saponaria var. drummondii	Tree	4	0.108%
Catalpa bignonioides	Tree	3	0.081%
Catalpa speciosa	Tree	3	0.081%
Fraxinus texensis	Tree	3	0.081%
Quercus pagoda	Tree	3	0.081%
Salix amygdaloides	Tree	3	0.081%
Elaeagnus angustifolia	Tree	2	0.054%
Prunus munsoniana	Tree	2	0.054%
Quercus gambelii	Tree	2	0.054%
Quercus mohriana	Tree	2	0.054%
Taxodium distichum	Tree	2	0.054%
Ulmus crassifolia	Tree	2	0.054%
Ailanthus altissima	Tree	1	0.027%
Carya laciniosa	Tree	1	0.027%
Cornus drummondii	Tree	1	0.027%
Prunus serotina	Tree	1	0.027%

Species	Stratum	# of plots	percent of plots
Pyrus calleryana	Tree	1	0.027%
Quercus prinoides	Tree	1	0.027%
Rhus aromatica var. aromatica	Tree	1	0.027%
Sambucus nigra	Tree	1	0.027%
Sassafras albidum	Tree	1	0.027%
Tilia americana	Tree	1	0.027%
Ulmus alata	Shrub	525	14.155%
Juniperus virginiana	Shrub	489	13.184%
Yucca glauca	Shrub	301	8.115%
Symphoricarpos orbiculatus	Shrub	281	7.576%
Celtis laevigata	Shrub	267	7.199%
Quercus marilandica	Shrub	246	6.633%
Ulmus rubra	Shrub	214	5.770%
Quercus stellata	Shrub	208	5.608%
Prosopis glandulosa	Shrub	181	4.880%
Diospyros virginiana	Shrub	179	4.826%
Cornus drummondii	Shrub	177	4.772%
Cercis canadensis	Shrub	175	4.718%
Prunus angustifolia	Shrub	171	4.610%
Artemisia filifolia	Shrub	160	4.314%
Ulmus americana	Shrub	146	3.936%
Gleditsia triacanthos	Shrub	136	3.667%
Salix nigra	Shrub	135	3.640%
Opuntia macrorhiza	Shrub	131	3.532%
Maclura pomifera	Shrub	127	3.424%
Sideroxylon lanuginosum	Shrub	122	3.289%
Rhus glabra	Shrub	109	2.939%
Fraxinus pennsylvanica	Shrub	97	2.615%
Carya illinoinensis	Shrub	96	2.588%
Cornus florida	Shrub	91	2.453%
Carya texana	Shrub	85	2.292%
Acer negundo	Shrub	79	2.130%
Opuntia phaeacantha	Shrub	78	2.103%
Morus rubra	Shrub	77	2.076%
Prunus serotina	Shrub	71	1.914%
Sapindus saponaria	Shrub	63	1.699%
Carya alba	Shrub	59	1.591%
Ulmus pumila	Shrub	57	1.537%
Rhus trilobata	Shrub	56	1.510%

Species	Stratum	# of plots	percent of plots
Celtis laevigata var. reticulata	Shrub	49	1.321%
Celtis occidentalis	Shrub	45	1.213%
Rhus copallinum	Shrub	45	1.213%
Ostrya virginiana	Shrub	37	0.998%
Juniperus pinchotii	Shrub	36	0.971%
Quercus velutina	Shrub	36	0.971%
Ribes aureum	Shrub	36	0.971%
Cephalanthus occidentalis	Shrub	35	0.944%
Fraxinus americana	Shrub	35	0.944%
Platanus occidentalis	Shrub	35	0.944%
Sassafras albidum	Shrub	33	0.890%
Quercus muehlenbergii	Shrub	31	0.836%
Robinia pseudoacacia	Shrub	31	0.836%
Amorpha fruticosa	Shrub	29	0.782%
Ilex decidua	Shrub	28	0.755%
Vaccinium arboreum	Shrub	28	0.755%
Nyssa sylvatica	Shrub	26	0.701%
Tamarix chinensis	Shrub	26	0.701%
Callicarpa americana	Shrub	24	0.647%
Juglans nigra	Shrub	23	0.620%
Quercus havardii	Shrub	23	0.620%
Frangula caroliniana	Shrub	21	0.566%
Populus deltoides	Shrub	21	0.566%
Acer rubrum	Shrub	20	0.539%
Juniperus ashei	Shrub	19	0.512%
Morus alba	Shrub	17	0.458%
Quercus nigra	Shrub	17	0.458%
Mimosa borealis	Shrub	16	0.431%
Opuntia imbricata	Shrub	16	0.431%
Pinus echinata	Shrub	15	0.404%
Tamarix ramosissima	Shrub	15	0.404%
Viburnum rufidulum	Shrub	15	0.404%
Rhus aromatica	Shrub	14	0.377%
Juniperus monosperma	Shrub	13	0.350%
Ligustrum sinense	Shrub	13	0.350%
Carpinus caroliniana	Shrub	12	0.324%
Echinocereus reichenbachii	Shrub	12	0.324%
Opuntia leptocaulis	Shrub	12	0.324%
Acer saccharum	Shrub	11	0.297%

Species	Stratum	# of plots	percent of plots
Liquidambar styraciflua	Shrub	11	0.297%
Prunus mexicana	Shrub	10	0.270%
Quercus macrocarpa	Shrub	10	0.270%
Gymnocladus dioicus	Shrub	9	0.243%
Albizia julibrissin	Shrub	8	0.216%
Prunus americana	Shrub	8	0.216%
Betula nigra	Shrub	7	0.189%
Pinus taeda	Shrub	7	0.189%
Salix exigua	Shrub	7	0.189%
Ziziphus obtusifolia	Shrub	7	0.189%
Quercus rubra	Shrub	6	0.162%
Acer saccharinum	Shrub	5	0.135%
Baccharis salicina	Shrub	5	0.135%
Carya cordiformis	Shrub	5	0.135%
Catalpa speciosa	Shrub	5	0.135%
Cercocarpus montanus	Shrub	5	0.135%
Hamamelis virginiana	Shrub	5	0.135%
Quercus alba	Shrub	5	0.135%
Crataegus crus-galli	Shrub	4	0.108%
Quercus gambelii	Shrub	4	0.108%
Ribes curvatum	Shrub	4	0.108%
Salix amygdaloides	Shrub	4	0.108%
Tilia americana	Shrub	4	0.108%
Vaccinium stamineum	Shrub	4	0.108%
Crataegus sp.	Shrub	3	0.081%
Echinocereus viridiflorus	Shrub	3	0.081%
Quercus mohriana	Shrub	3	0.081%
Rosa sp.	Shrub	3	0.081%
Salix caroliniana	Shrub	3	0.081%
Sambucus nigra	Shrub	3	0.081%
Ulmus crassifolia	Shrub	3	0.081%
Aesculus glabra	Shrub	2	0.054%
Asimina triloba	Shrub	2	0.054%
Carya ovata	Shrub	2	0.054%
Elaeagnus angustifolia	Shrub	2	0.054%
Escobaria vivipara	Shrub	2	0.054%
Forestiera pubescens	Shrub	2	0.054%
Fraxinus texensis	Shrub	2	0.054%
Pyrus calleryana	Shrub	2	0.054%

Species	Stratum	# of plots	percent of plots
Quercus falcata	Shrub	2	0.054%
Quercus phellos	Shrub	2	0.054%
Quercus shumardii	Shrub	2	0.054%
Zanthoxylum hirsutum	Shrub	2	0.054%
Acacia angustissima	Shrub	1	0.027%
Ailanthus altissima	Shrub	1	0.027%
Baccharis neglecta	Shrub	1	0.027%
Broussonetia papyrifera	Shrub	1	0.027%
Catalpa bignonioides	Shrub	1	0.027%
Forestiera acuminata	Shrub	1	0.027%
Hydrangea arborescens	Shrub	1	0.027%
Hypericum prolificum	Shrub	1	0.027%
Ilex opaca	Shrub	1	0.027%
Opuntia polyacantha	Shrub	1	0.027%
Ptelea trifoliata	Shrub	1	0.027%
Quercus fusiformis	Shrub	1	0.027%
Quercus palustris	Shrub	1	0.027%
Rosa foliolosa	Shrub	1	0.027%
Sapindus saponaria var. drummondii	Shrub	1	0.027%
Cynodon dactylon	Herb	859	23.160%
Smilax bona-nox	Herb	711	19.170%
Bromus arvensis	Herb	609	16.420%
Elymus canadensis	Herb	366	9.868%
Ambrosia psilostachya	Herb	346	9.329%
Bromus tectorum	Herb	345	9.302%
Schizachyrium scoparium	Herb	330	8.897%
Amphiachyris dracunculoides	Herb	327	8.816%
Schedonorus phoenix	Herb	309	8.331%
Sorghum halepense	Herb	262	7.064%
Vitis cinerea	Herb	241	6.498%
Toxicodendron radicans	Herb	236	6.363%
Bothriochloa laguroides	Herb	227	6.120%
Parthenocissus quinquefolia	Herb	223	6.012%
Triticum aestivum	Herb	179	4.826%
Bromus catharticus	Herb	164	4.422%
Bouteloua curtipendula	Herb	149	4.017%
Chasmanthium latifolium	Herb	149	4.017%
Panicum virgatum	Herb	142	3.829%
Lespedeza cuneata	Herb	125	3.370%

Species	Stratum	# of plots	percent of plots
Gutierrezia sarothrae	Herb	121	3.262%
Artemisia ludoviciana	Herb	109	2.939%
Sporobolus cryptandrus	Herb	105	2.831%
Bouteloua gracilis	Herb	104	2.804%
Ampelopsis cordata	Herb	96	2.588%
Bothriochloa ischaemum	Herb	94	2.534%
Andropogon gerardii	Herb	90	2.427%
Danthonia spicata	Herb	90	2.427%
Campsis radicans	Herb	85	2.292%
Tridens flavus	Herb	83	2.238%
Hordeum pusillum	Herb	81	2.184%
Lonicera japonica	Herb	79	2.130%
Helenium amarum	Herb	76	2.049%
Ambrosia trifida	Herb	63	1.699%
Lolium perenne	Herb	62	1.672%
Croton monanthogynus	Herb	57	1.537%
Setaria parviflora	Herb	56	1.510%
Ambrosia artemisiifolia	Herb	55	1.483%
Unknown	Herb	54	1.456%
Solidago ulmifolia	Herb	53	1.429%
Xanthium strumarium	Herb	50	1.348%
Croton capitatus	Herb	49	1.321%
Tridens strictus	Herb	48	1.294%
Rubus sp.	Herb	46	1.240%
Aristida oligantha	Herb	45	1.213%
Helianthus hirsutus	Herb	45	1.213%
Plantago patagonica	Herb	44	1.186%
Vitis palmata	Herb	42	1.132%
Solanum elaeagnifolium	Herb	39	1.051%
Conyza canadensis	Herb	38	1.025%
Eragrostis curvula	Herb	38	1.025%
Zea mays	Herb	38	1.025%
Smilax herbacea	Herb	35	0.944%
Chasmanthium laxum	Herb	34	0.917%
Vitis acerifolia	Herb	34	0.917%
Eragrostis trichodes	Herb	33	0.890%
Sorghastrum nutans	Herb	33	0.890%
Thelesperma filifolium	Herb	33	0.890%
Aegilops cylindrica	Herb	32	0.863%

Species	Stratum	# of plots	percent of plots
Solidago nemoralis	Herb	31	0.836%
Digitaria sanguinalis	Herb	30	0.809%
Bouteloua dactyloides	Herb	29	0.782%
Dichanthelium acuminatum	Herb	29	0.782%
Paspalum dilatatum	Herb	29	0.782%
Vernonia baldwinii	Herb	28	0.755%
Vitis aestivalis	Herb	28	0.755%
Antennaria parlinii	Herb	26	0.701%
Bouteloua hirsuta	Herb	25	0.674%
Plantago aristata	Herb	25	0.674%
Eragrostis spectabilis	Herb	24	0.647%
Croton texensis	Herb	22	0.593%
Trifolium dubium	Herb	22	0.593%
Medicago sativa	Herb	21	0.566%
Torilis arvensis	Herb	21	0.566%
Ambrosia bidentata	Herb	20	0.539%
Coreopsis tinctoria	Herb	19	0.512%
Helianthus petiolaris	Herb	19	0.512%
Lepidium virginicum	Herb	19	0.512%
Salsola tragus	Herb	19	0.512%
Cocculus carolinus	Herb	18	0.485%
Chloris verticillata	Herb	17	0.458%
Chloris virgata	Herb	17	0.458%
Rudbeckia hirta	Herb	17	0.458%
Smilax tamnoides	Herb	17	0.458%
Plantago wrightiana	Herb	16	0.431%
Bothriochloa saccharoides	Herb	15	0.404%
Grindelia squarrosa	Herb	15	0.404%
Schoenoplectus americanus	Herb	15	0.404%
Solidago canadensis	Herb	15	0.404%
Berchemia scandens	Herb	13	0.350%
Equisetum hyemale	Herb	13	0.350%
Pleuraphis mutica	Herb	13	0.350%
Symphyotrichum ericoides	Herb	13	0.350%
Capsella bursa-pastoris	Herb	12	0.324%
Eupatorium serotinum	Herb	12	0.324%
Sorghum bicolor	Herb	12	0.324%
Typha domingensis	Herb	12	0.324%
Erodium cicutarium	Herb	11	0.297%

Species	Stratum	# of plots	percent of plots
Lappula occidentalis	Herb	11	0.297%
Rumex crispus	Herb	11	0.297%
Tetraneuris scaposa	Herb	11	0.297%
Toxicodendron pubescens	Herb	11	0.297%
Arundinaria gigantea	Herb	10	0.270%
Centaurea americana	Herb	10	0.270%
Polygonum hydropiperoides	Herb	10	0.270%
Tridens albescens	Herb	10	0.270%
Ampelopsis arborea	Herb	9	0.243%
Eragrostis cilianensis	Herb	9	0.243%
Eriogonum annuum	Herb	9	0.243%
Grindelia papposa	Herb	9	0.243%
Sporobolus compositus	Herb	9	0.243%
Vulpia octoflora	Herb	9	0.243%
Achillea millefolium	Herb	8	0.216%
Descurainia pinnata	Herb	8	0.216%
Glycine max	Herb	8	0.216%
Gossypium hirsutum	Herb	8	0.216%
Justicia americana	Herb	8	0.216%
Leptochloa fusca	Herb	8	0.216%
Liatris punctata	Herb	8	0.216%
Nassella leucotricha	Herb	8	0.216%
Smilax rotundifolia	Herb	8	0.216%
Solanum carolinense	Herb	8	0.216%
Solanum dimidiatum	Herb	8	0.216%
Andropogon hallii	Herb	7	0.189%
Calamovilfa gigantea	Herb	7	0.189%
Cenchrus spinifex	Herb	7	0.189%
Cirsium undulatum	Herb	7	0.189%
Coelorachis cylindrica	Herb	7	0.189%
Heterotheca stenophylla	Herb	7	0.189%
Lesquerella gordonii	Herb	7	0.189%
Silphium radula	Herb	7	0.189%
Vitis riparia	Herb	7	0.189%
Vulpia myuros	Herb	7	0.189%
Aphanostephus skirrhobasis	Herb	6	0.162%
Carduus nutans	Herb	6	0.162%
Cenchrus longispinus	Herb	6	0.162%
Croton lindheimerianus	Herb	6	0.162%

Species	Stratum	# of plots	percent of plots
Echinochloa crus-galli	Herb	6	0.162%
Festuca subverticillata	Herb	6	0.162%
Hymenopappus flavescens	Herb	6	0.162%
Muhlenbergia arenicola	Herb	6	0.162%
Phytolacca americana	Herb	6	0.162%
Vitis vulpina	Herb	6	0.162%
Amaranthus retroflexus	Herb	5	0.135%
Aristida purpurascens	Herb	5	0.135%
Convolvulus arvensis	Herb	5	0.135%
Desmanthus illinoensis	Herb	5	0.135%
Dichanthelium boscii	Herb	5	0.135%
Helianthus maximiliani	Herb	5	0.135%
Heliotropium tenellum	Herb	5	0.135%
Melilotus officinalis	Herb	5	0.135%
Pascopyrum smithii	Herb	5	0.135%
Solanum rostratum	Herb	5	0.135%
Thelesperma megapotamicum	Herb	5	0.135%
Toxicodendron radicans ssp. negundo	Herb	5	0.135%
Abutilon theophrasti	Herb	4	0.108%
Apocynum cannabinum	Herb	4	0.108%
Aristida purpurea	Herb	4	0.108%
Artemisia sp.	Herb	4	0.108%
Chasmanthium sessiliflorum	Herb	4	0.108%
Daucus carota	Herb	4	0.108%
Distichlis spicata	Herb	4	0.108%
Elymus virginicus	Herb	4	0.108%
Eupatorium perfoliatum	Herb	4	0.108%
Euphorbia marginata	Herb	4	0.108%
Festuca paradoxa	Herb	4	0.108%
Helianthus mollis	Herb	4	0.108%
Ipomoea hederacea	Herb	4	0.108%
Paspalum urvillei	Herb	4	0.108%
Pediomelum cuspidatum	Herb	4	0.108%
Phyla lanceolata	Herb	4	0.108%
Solidago missouriensis	Herb	4	0.108%
Aster sp.	Herb	3	0.081%
Calylophus hartwegii	Herb	3	0.081%
Cardiospermum halicacabum	Herb	3	0.081%
Conium maculatum	Herb	3	0.081%

Species	Stratum	# of plots	percent of plots
Eragrostis intermedia	Herb	3	0.081%
Gaillardia pulchella	Herb	3	0.081%
Gaillardia suavis	Herb	3	0.081%
Helianthus annuus	Herb	3	0.081%
Hypericum drummondii	Herb	3	0.081%
Iva annua	Herb	3	0.081%
Lactuca serriola	Herb	3	0.081%
Liatris aspera	Herb	3	0.081%
Lindheimera texana	Herb	3	0.081%
Ludwigia peploides	Herb	3	0.081%
Monarda punctata	Herb	3	0.081%
Nelumbo lutea	Herb	3	0.081%
Oenothera rhombipetala	Herb	3	0.081%
Panicum obtusum	Herb	3	0.081%
Paspalum floridanum	Herb	3	0.081%
Paspalum setaceum	Herb	3	0.081%
Phyla nodiflora	Herb	3	0.081%
Plantago rhodosperma	Herb	3	0.081%
Polystichum acrostichoides	Herb	3	0.081%
Ratibida columnifera	Herb	3	0.081%
Sporobolus airoides	Herb	3	0.081%
Typha angustifolia	Herb	3	0.081%
Vitis rotundifolia	Herb	3	0.081%
Amaranthus tuberculatus	Herb	2	0.054%
Ambrosia grayi	Herb	2	0.054%
Arundo donax	Herb	2	0.054%
Asclepias viridis	Herb	2	0.054%
Astragalus lindheimeri	Herb	2	0.054%
Bromus inermis	Herb	2	0.054%
Brunnichia ovata	Herb	2	0.054%
Celastrus scandens	Herb	2	0.054%
Chamaesyce fendleri	Herb	2	0.054%
Chamaesyce missurica	Herb	2	0.054%
Chenopodium album	Herb	2	0.054%
Cnidoscolus texanus	Herb	2	0.054%
Cucurbita foetidissima	Herb	2	0.054%
Desmodium sp.	Herb	2	0.054%
Dichanthelium aciculare	Herb	2	0.054%
Dichanthelium oligosanthes	Herb	2	0.054%

Species	Stratum	# of plots	percent of plots
Echinacea angustifolia	Herb	2	0.054%
Echinochloa colona	Herb	2	0.054%
Echinochloa muricata	Herb	2	0.054%
Eleocharis erythropoda	Herb	2	0.054%
Eragrostis curtipedicellata	Herb	2	0.054%
Eragrostis secundiflora	Herb	2	0.054%
Eryngium leavenworthii	Herb	2	0.054%
Eupatorium altissimum	Herb	2	0.054%
Gaillardia sp.	Herb	2	0.054%
Galium circaezans	Herb	2	0.054%
Heterotheca villosa	Herb	2	0.054%
Ipomoea purpurea	Herb	2	0.054%
Lactuca canadensis	Herb	2	0.054%
Leptochloa panicea ssp. mucronata	Herb	2	0.054%
Linum perenne	Herb	2	0.054%
Ludwigia alternifolia	Herb	2	0.054%
Machaeranthera tanacetifolia	Herb	2	0.054%
Mentzelia nuda	Herb	2	0.054%
Paspalum pubiflorum	Herb	2	0.054%
Pediomelum digitatum	Herb	2	0.054%
Phragmites australis	Herb	2	0.054%
Plantago lanceolata	Herb	2	0.054%
Plantago rugelii	Herb	2	0.054%
Poa arachnifera	Herb	2	0.054%
Polygonum aviculare	Herb	2	0.054%
Polygonum lapathifolium	Herb	2	0.054%
Pueraria montana	Herb	2	0.054%
Pycnanthemum albescens	Herb	2	0.054%
Rumex acetosella	Herb	2	0.054%
Rumex altissimus	Herb	2	0.054%
Sonchus asper	Herb	2	0.054%
Spartina pectinata	Herb	2	0.054%
Tetraneuris linearifolia	Herb	2	0.054%
Tradescantia occidentalis	Herb	2	0.054%
Tribulus terrestris	Herb	2	0.054%
Urtica dioica	Herb	2	0.054%
Viola sp.	Herb	2	0.054%
Acalypha virginica	Herb	1	0.027%
Adiantum pedatum	Herb	1	0.027%

Species	Stratum	# of plots	percent of plots
Alisma subcordatum	Herb	1	0.027%
Amaranthus albus	Herb	1	0.027%
Amaranthus palmeri	Herb	1	0.027%
Amphicarpaea bracteata	Herb	1	0.027%
Argemone polyanthemos	Herb	1	0.027%
Aristida purpurea var. nealleyi	Herb	1	0.027%
Artemisia campestris	Herb	1	0.027%
Artemisia dracunculus	Herb	1	0.027%
Asclepias viridiflora	Herb	1	0.027%
Baptisia australis	Herb	1	0.027%
Bassia scoparia	Herb	1	0.027%
Bothriochloa bladhii	Herb	1	0.027%
Bouteloua rigidiseta	Herb	1	0.027%
Buglossoides arvensis	Herb	1	0.027%
Chamaesyce glyptosperma	Herb	1	0.027%
Chenopodium berlandieri	Herb	1	0.027%
Chenopodium standleyanum	Herb	1	0.027%
Chloris cucullata	Herb	1	0.027%
Cicuta maculata	Herb	1	0.027%
Cirsium ochrocentrum	Herb	1	0.027%
Cirsium vulgare	Herb	1	0.027%
Cyperus echinatus	Herb	1	0.027%
Cyperus erythrorhizos	Herb	1	0.027%
Cyperus strigosus	Herb	1	0.027%
Dalea enneandra	Herb	1	0.027%
Dalea purpurea	Herb	1	0.027%
Desmodium glutinosum	Herb	1	0.027%
Desmodium paniculatum	Herb	1	0.027%
Echinacea pallida	Herb	1	0.027%
Eleocharis montevidensis	Herb	1	0.027%
Eleocharis sp.	Herb	1	0.027%
Eleusine indica	Herb	1	0.027%
Elodea canadensis	Herb	1	0.027%
Eragrostis hirsuta	Herb	1	0.027%
Erigeron philadelphicus	Herb	1	0.027%
Eriochloa contracta	Herb	1	0.027%
Eryngium yuccifolium	Herb	1	0.027%
Euphorbia dentata	Herb	1	0.027%
Festuca sp.	Herb	1	0.027%

Species	Stratum	# of plots	percent of plots
Galium aparine	Herb	1	0.027%
Gaura coccinea	Herb	1	0.027%
Gaura longiflora	Herb	1	0.027%
Geum canadense	Herb	1	0.027%
Guilleminea densa	Herb	1	0.027%
Hoffmannseggia glauca	Herb	1	0.027%
Hordeum jubatum	Herb	1	0.027%
Hymenopappus tenuifolius	Herb	1	0.027%
Hymenoxys odorata	Herb	1	0.027%
Ipomoea pandurata	Herb	1	0.027%
Juncus diffusissimus	Herb	1	0.027%
Juncus torreyi	Herb	1	0.027%
Lepidium densiflorum	Herb	1	0.027%
Leptochloa fusca ssp. fascicularis	Herb	1	0.027%
Ludwigia palustris	Herb	1	0.027%
Medicago lupulina	Herb	1	0.027%
Monarda clinopodioides	Herb	1	0.027%
Nothoscordum bivalve	Herb	1	0.027%
Oenothera grandis	Herb	1	0.027%
Oenothera laciniata	Herb	1	0.027%
Oligoneuron rigidum	Herb	1	0.027%
Oxalis stricta	Herb	1	0.027%
Oxalis violacea	Herb	1	0.027%
Panicum capillare	Herb	1	0.027%
Panicum rigidulum	Herb	1	0.027%
Paspalum distichum	Herb	1	0.027%
Passiflora lutea	Herb	1	0.027%
Pediomelum linearifolium	Herb	1	0.027%
Penstemon cobaea	Herb	1	0.027%
Phegopteris hexagonoptera	Herb	1	0.027%
Phyla cuneifolia	Herb	1	0.027%
Physalis angulata	Herb	1	0.027%
Polygonum amphibium	Herb	1	0.027%
Polygonum aubertii	Herb	1	0.027%
Polygonum pensylvanicum	Herb	1	0.027%
Polygonum scandens	Herb	1	0.027%
Polytaenia nuttallii	Herb	1	0.027%
Portulaca oleracea	Herb	1	0.027%
Portulaca pilosa	Herb	1	0.027%

Species	Stratum	# of plots	percent of plots
Potentilla simplex	Herb	1	0.027%
Rhynchosia latifolia	Herb	1	0.027%
Rosa multiflora	Herb	1	0.027%
Rubus trivialis	Herb	1	0.027%
Rumex hymenosepalus	Herb	1	0.027%
Sabatia campestris	Herb	1	0.027%
Salvia azurea	Herb	1	0.027%
Schoenoplectus tabernaemontani	Herb	1	0.027%
Secale cereale	Herb	1	0.027%
Sesbania herbacea	Herb	1	0.027%
Setaria viridis	Herb	1	0.027%
Silphium laciniatum	Herb	1	0.027%
Solidago petiolaris	Herb	1	0.027%
Solidago sp.	Herb	1	0.027%
Sporobolus wrightii	Herb	1	0.027%
Stachys sp.	Herb	1	0.027%
Strophostyles helvola	Herb	1	0.027%
Tragopogon dubius	Herb	1	0.027%
Verbascum thapsus	Herb	1	0.027%
Verbena alternifolia	Herb	1	0.027%
Verbena bracteata	Herb	1	0.027%
Verbena brasiliensis	Herb	1	0.027%
Verbesina alternifolia	Herb	1	0.027%
Vitis mustangensis	Herb	1	0.027%
Zizaniopsis miliacea	Herb	1	0.027%

Appendix 2: Mapped Types with Short Descriptions, Area, and Number of Ground Data Points.

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Arbuckle: Ashe Juniper Shrubland	This type contains Ashe juniper among the dominants together with deciduous shrubs and trees. Important components may include stretchberry (elbow-bush), eastern redbud, gum bumelia, scaleybark (bastard) oak, chinkapin oak, post oak, blackjack oak, and winged elm. Eastern redcedar may replace Ashe juniper in some stands.	4,831.3	11,938.4	0.03%	5	0
Arbuckle: Ashe Juniper Woodland	This type is characterized by Ashe juniper among the dominant species in the tree or shrub layer, or both. Other common deciduous trees and shrubs may include Buckley oak, Texas ash, scaleybark (bastard) oak, stretchberry (elbow-bush), sugar hackberry, gum bumelia, slippery elm, and chinkapin oak. Eastern redcedar may be a component, replacing Ashe juniper, in some stands.	3,269.3	8,078.7	0.018%	5	0
Arbuckle: Deciduous Shrubland	This type is dominated by deciduous shrubs and small or sparse trees but may contain Ashe juniper or eastern redcedar as a component. Common woody components may include stretchberry (elbow-bush), eastern redbud, gum bumelia, scaleybark (bastard) oak, post oak, blackjack oak, chinkapin oak, and winged elm.	2,599.5	6,423.4	0.014%	4	0
Arbuckle: Juniper Slope Forest	This type is mapped on slopes >20%, and includes sites over more or less calcareous soils. Composition is similar to the Arbuckle: Ashe Juniper Woodland, but stands tend to be more dense and more diverse. Ashe juniper, eastern redcedar, post oak, blackjack oak, Buckley oak, scaleybark (bastard) oak, Texas ash, stretchberry (elbow-bush), and chinkapin oak are common components.	1,196.0	2,955.3	0.007%	1	0
Arbuckle: Oak - Juniper Slope Forest	This type is mapped on slopes >20%, and includes sites over more or less calcareous soils. Composition depends mainly on substrate, with species such as Buckley oak, chinkapin oak, Shumard oak, and Texas ash occurring over limestones and species such as post oak, bitternut hickory, black oak, and blackjack oak more important over acidic substrates. Sugar hackberry, winged elm, Ashe juniper, eastern redcedar, and slippery elm are other common woody components.	272.8	674.2	0.002%	0	0
Arbuckle: Oak - Juniper Woodland	This type is mapped over limestone (more calcareous) and dolomite (less calcareous) soils. Ashe juniper is more important over limestone, whereas eastern redcedar is more important over less calcareous soils. Important deciduous species include post oak, sugar hackberry, blackjack oak, chinkapin oak, Buckley oak, black oak, and winged elm.	514.7	1,271.8	0.003%	0	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Arbuckle: Oak Slope Forest	This type is mapped on slopes >20% and may include a fairly wide diversity of overstory trees. Common components include post oak, chinkapin oak, Buckley's oak, black oak, Texas ash, bitternut hickory, and Shumard oak. Ashe juniper or eastern redcedar are often components, and eastern redbud, gum bumelia, and elbowbush are common in the understory.	5,055.4	12,492.2	0.028%	5	0
Arbuckle: Oak Woodland	This type may occur over limestone (more calcareous) or dolomite (less calcareous) soils. Important deciduous species may include post oak, blackjack oak, black oak, chinkapin oak, winged elm, sugar hackberry, Shumard oak, and Buckley oak. Ashe juniper is common over limestones whereas eastern redcedar is common on less calcareous soils.	18,594.8	45,948.7	0.103%	8	0
Arbuckle: Prairie/Pasture	In the modern landscape, this type is mainly dominated by grazing-tolerant native or non-native species such as field brome, Bermudagrass, prairie broomweed, purple three-awn, and silver bluestem. Woody species such as sugar hackberry, winged elm, honeylocust, and juniper species may be components.	82,776.9	204,545.8	0.457%	39	0
Arkansas Valley: Prairie/Pasture	This type circumscribes a variety of grasslands. In the modern landscape, non-native and grazing-tolerant species such as Bermudagrass, field brome, marsh bristlegrass, thickspike tridens, and tall fescue are common components. Some native hay meadows or lightly grazed native sod may be dominated by native prairie species such as little bluestem, switchgrass, yellow Indiangrass, and big bluestem.	164,770.2	407,155.4	0.910%	24	1
Arkansas Valley: Sandy Prairie/Pasture	This type occurs over more or less deep sands of the Arkansas River valley in far eastern Oklahoma, and consists mainly of grazed pastures in the modern landscape, although some areas of native hay and disturbed sands near the river also occur. Common components include Bermudagrass, field borne, thickspike tridens, and silver bluestem. Native hay meadows have species such as big bluestem, switchgrass, little bluestem, and yellow Indiangrass.	996.5	2,462.4	0.006%	0	0
Barren	This type consists of areas that were largely unvegetated at the time of satellite remote sensing data collection (circa 2012).	40,862.8	100,974.0	0.226%	3	3
Black Mesa: Deciduous Shrubland and Woodland	This type is represented mainly by open shrublands with skunkbush sumac, Gambel oak, mountain mahogany and Mohr's shin oak. Mesquite, one-seed juniper, and succulents such as tree cholla and soapweed yucca are common. Grama species, little bluestem, silver bluestem, and sand dropseed are common grasses. .	5,493.4	13,574.5	0.030%	4	0
Black Mesa: Pinyon - Juniper Shrubland	This type forms sparse woodlands or shrublands dominated by one-seed juniper and two-needle pinyon. Common shrubs include skunkbush sumac, mountain mahogany, and Gambel oak. Grasses may include sideoats, blue, and hairy grama, sand dropseed, and tobosa. Soapweed yucca and tree cholla are common succulents.	8,894.3	21,978.3	0.049%	3	4

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Black Mesa: Pinyon - Juniper Woodland	This type forms fairly dense woodlands with two-needle pinyon and one-see juniper as important components. Common shrubs include skunkbush sumac, mountain mahogany, and Gambel oak. Grasses may include sideoats, blue, and hairy grama, sand dropseed, and tobosa. Soapweed yucca and tree cholla are common succulents.	1,097.4	2,711.7	0.006%	3	1
Blackland: Pasture/Prairie	In the modern landscape this type is most often represented by heavily grazed pasture dominated by non-native and grazing tolerate species such as Bermudagrass, field brome, and tall fescue. Areas with lower levels of grazing may have species such as little bluestem, yellow Indiangrass, and big bluestem among the dominants.	3,290.6	8,131.3	0.018%	0	1
Canyon: Deciduous Shrubland	This type is mapped in broken landscapes associated with weathering of sedimentary rocks that do not contain much gyp. Common shrubs include skunkbush sumac, fragrant sumac, Mohr shin oak, Chickasaw plum, lotebush, and mesquite (within range). Eastern redcedar and sandage may also be components. Short and mid-grasses such as sideoats grama, hairy grama, tobosa, sand dropseed, little bluestem, silver bluestem, and cheatgrass occur in the modern landscape. Grazing-tolerant forbs such as stiff greenthread, broom snakeweed, and prairie broomweed are common.	29,512.2	72,926.1	0.163%	1	6
Canyon: Grassland	This type is mapped in broken landscapes associated with weathering of sedimentary rocks that do not contain much gyp. Short and mid-grasses such as sideoats grama, hairy grama, tobosa, sand dropseed, little bluestem, silver bluestem, and cheatgrass occur in the modern landscape. Grazing-tolerant forbs such as stiff greenthread, broom snakeweed, white sagebrush, and prairie broomweed are common. Common shrubs include skunkbush sumac, Chickasaw plum, lotebush, and mesquite (within range). Eastern redcedar and sandage may also be components.	23,615.4	58,354.7	0.130%	9	5
Canyon: Gyp Deciduous Shrubland	This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches or layers of gyp on slopes are common. Important shrubs may include skunkbush sumac, lotebush, mesquite (within range), and Mohr shin oak. Succulents such as soapweed yucca, pricklypear, and Christmas cactus may be present. Pinchot's juniper, or less commonly, eastern redcedar may be present. Short and mid-grasses such as gramas, little bluestem, cane bluestem, and annual dropseeds are also common.	14,707.9	36,344.0	0.081%	2	1

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Canyon: Gyp Grassland	This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches or layers of gyp on slopes are common. Short and mid-grasses such as sideoats grama, blue grama, hairy grama, little bluestem, cane bluestem, sand dropseed, and annual bromes are also common. Forbs common in the modern landscape include broom snakeweed, common broomweed, stiff greenthread, Navajo tea, Indian breadroot, stemmy four-nerve daisy, sundrops species, and western ragweed. Important shrubs may include skunkbush sumac, lotebush, mesquite (within range), and Mohr shin oak. Succulents such as soapweed yucca, pricklypear, and Christmas cactus may be present. Pinchot's juniper, or less commonly, eastern redcedar may be present.	67,378.6	166,495.8	0.372%	32	10
Canyon: Gyp Juniper Shrubland	This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches or layers of gyp on slopes are common. Pinchot's juniper is the most common dominant, but eastern redcedar may be locally important. Other woody species may include sumac species, lotebush, mesquite (within range), soapberry, sugar hackberry, gum bumelia, and Siberian elm. Short and mid-grasses such as gramas, little bluestem, cane bluestem, and annual dropseeds are important, along with forbs such as broom snakeweed and common broomweed.	9,413.6	23,261.4	0.052%	2	5
Canyon: Gyp Mesquite Shrubland	This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches or layers of gyp are common in the landscape. Small (10 sq m to 200 sq m), open, sparsely vegetated patches of gyp are common. This type is often mapped low on the landscape at the base of slopes or on canyon bottoms. Mesquite is the most common dominant, and species such as lotebush, Pinchot's juniper, eastern redcedar, soapberry, and sugar hackberry may be present. This type may be more or less open, with elements of the Canyon: Gyp Grassland common.	7,184.6	17,753.6	0.040%	4	2
Canyon: Gyp Sparsely Vegetated	This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches of open gyp with bare rock or bare ground or sparse vegetation occur over fairly extensive areas (>1000 sq m). Herbaceous and shrubby elements of other Canyon: Gyp types may be present.	211.0	521.3	0.001%	0	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Canyon: Juniper Shrubland	This type is mapped in broken landscapes associated with weathering of sedimentary rocks that do not contain much gyp. Eastern redcedar is the most common dominant, but Pinchot's juniper may also be dominant. Other important woody species may include skunkbush sumac, fragrant sumac, Mohr shin oak, Chickasaw plum, lotebush, Siberian elm, sugar hackberry, and mesquite (within range). Eastern redcedar and sandage may also be components. Short and mid-grasses such as sideoats grama, hairy grama, tobosa, sand dropseed, little bluestem, silver bluestem, and cheatgrass occur in the modern landscape. Grazing-tolerant forbs such as stiff greenthread, broom snakeweed, and prairie broomweed are common.	22,458.7	55,496.6	0.124%	7	4
Canyon: Sparsely Vegetated	This type is mapped in broken landscapes associated with weathering of sedimentary rocks where patches of open bare ground or very open vegetation occur over fairly extensive areas (>1000 sq m). Herbaceous and shrubby elements of other Canyon types may be present.	47.0	116.2	0.000%	0	0
Central Mixedgrass: Prairie/Pasture	This type circumscribes a variety of grasslands in different conditions across broad gradients in both moisture and temperature. In the modern landscape, non-native and grazing-tolerant species such as field brome, Bermudagrass, prairie broomweed, cheatgrass, three-awn species, hairy grama, other grama species, buffalograss, and western ragweed are common. Species such as little bluestem, silver bluestem, and sideoats grama may be more important in less heavily grazed areas, especially to the east within this type. Woody components may include mesquite (south), eastern redcedar, Osage orange, and honeylocust.	2,162,501.4	5,343,649.0	11.946%	420	139
Central Mixedgrass: Sandy Prairie/Pasture	In the modern landscape, this type is mainly represented by grazed pastures with species such as cheatgrass, western ragweed, sand dropseed, field brome, King Ranch Bluestem, and Bermudagrass common. Areas with less grazing pressure have species such as little bluestem, sideoats grama, silver bluestem, blue grama, and big bluestem. Other common species include snake broomweed, prairie broom weed, white sagebrush, and soapweed yucca. Eastern redcedar, honey mesquite (within range), sand sagebrush, and Chickasaw plum may be present.	141,365.3	349,320.7	0.781%	25	9
Crosstimbers: Eastern Redcedar Slope Woodland and Shrubland	This type is mapped on slopes >20%, and composition is similar to the Crosstimbers: Eastern Redcedar Woodland and Shrubland type, although it is commonly dominated by taller trees rather than shrubs, and canopy closure tends to be higher. Common associated trees include post oak, blackjack oak, sugar hackberry, gum bumelia, winged elm, and black hickory.	3,691.6	9,122.1	0.020%	0	1

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Crosstimbers: Eastern Redcedar Woodland and Shrubland	This type circumscribes young, sparse woodlands and shrublands as well as more dense woodlands where eastern redcedar is a significant component. Other important woody species may include post oak, blackjack oak, hackberry species, gum bumelia, winged elm, and black hickory.	35,173.7	86,916.0	0.194%	12	7
Crosstimbers: Pasture/Prairie	This type is mapped essentially from the southern border to the northern border of Oklahoma, and across the east to west extent of the Crosstimbers and transition zone of central Oklahoma. In the modern landscape, non-native and grazing-tolerant species dominant most areas. Common species include Bermudagrass, field brome, western (Cuman) ragweed, and tall fescue. More lightly-grazed areas or hay meadows may have species such as little bluestem, silver bluestem, switchgrass, big bluestem, sideoats grama, and yellow Indiangrass. Woody species such as post oak, pecan, blackjack oak, winged elm, eastern redcedar, honeylocust, Osage orange, and common persimmon may be components.	2,498,205.4	6,173,190.5	13.800%	556	27
Crosstimbers: Post Oak - Blackjack Oak Forest and Woodland	This type is mapped on typical woodland soils across a wide swath of central Oklahoma. Woodland quality and successional state varies within the type. Common dominants include post oak, blackjack oak, black hickory, black oak, winged elm, pecan, and Shumard oak. Eastern redcedar is a common component. Understory species may include coralberry, eastern redbud, rough dogwood, common persimmon, and gum bumelia.	1,035,809.0	2,559,535.8	5.722%	265	36
Crosstimbers: Post Oak - Blackjack Oak Slope Forest	This type is mapped on slopes >20% and composition is similar to Crosstimbers: Post Oak – Blackjack Oak Forest, although these stands tend to have more canopy and more often contain older trees. Common components include post oak, blackjack oak, black hickory, black oak, green ash, winged elm, redbud, and rough dogwood.	62,940.2	155,528.3	0.348%	15	1
Crosstimbers: Post Oak - Eastern Redcedar Forest and Woodland	This type is mapped on typical woodland soils across a wide swath of central Oklahoma. Woodland quality and successional state varies within the type, but eastern redcedar is among the dominants. Other common species may include post oak, blackjack oak, black hickory, black oak, winged elm, pecan, and Shumard oak. Understory species may include coralberry, eastern redbud, rough dogwood, Osage orange, and gum bumelia.	11,396.9	28,162.2	0.063%	1	0
Crosstimbers: Post Oak - Eastern Redcedar Slope Forest	This type is mapped on slopes >20%, and is similar to the Crosstimbers: Post Oak - Eastern Redcedar Forest type, although stands tend to have more canopy cover. Eastern redcedar is an important component, together with species such as post oak, black hickory, blackjack oak, redbud, gum bumelia, green ash, winged elm, and rough dogwood.	1,495.8	3,696.2	0.008%	0	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Crosstimbers: Sandyland Post Oak - Blackjack Oak Forest and Woodland	This type is mapped over more or less deep, wind- or water-deposited sands. Common trees include post oak, blackjack oak, black hickory, sugar hackberry, and pecan. Open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.	70,360.8	173,865.1	0.389%	19	11
Crosstimbers: Sandyland Shrubland and Grassland	This type is mapped over more or less deep sands and in the modern landscape if most often represented by grazed pasture with non-native and grazing-tolerant species such as Bermudagrass, tall fescue, annual ragweed, weeping lovegrass, Johnsongrass, and sandbur species. Overall herbaceous species diversity tends to be fairly high over deeper sand, and some may contain species such as little bluestem, pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack. Common woody components include Chickasaw plum, post oak, winged elm, and blackjack oak.	166,932.7	412,498.9	0.922%	35	4
Crosstimbers: Young Post Oak - Blackjack Oak Woodland	This type represents pastures and woodland edges with sparse successional vegetation, including shrubs and trees. Common woody species include blackjack oak, post oak, winged elm, sumac species, hackberry species, common persimmon, honeylocust, gum bumelia, and pecan. Herbaceous areas have species such as Bermudagrass, field brome, tall fescue, purpletop tridens, little bluestem, and silver bluestem. Vines such as eastern poison ivy and greenbriar species are common.	71,701.7	177,178.4	0.396%	18	10
Disturbed Soil Pasture	This type is mapped over soils defined as disturbed by digital soil surveys (e.g. slickspots, pits). Non-native and disturbance species such as Bermudagrass, tall fescue, Johnsongrass, winged elm, and honeylocust are common components.	24,868.3	61,450.8	0.137%	2	0
Eastern Great Plains: Herbaceous Wetland	This type circumscribes all varieties of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	12,404.2	30,651.4	0.069%	2	1
Flint Hills: Tallgrass Prairie/Pasture	This type occurs mainly over unbroken sod in grazed pastures in the modern landscape, but some native hay meadows are also present. Common grazing-tolerant species include field brome, tall fescue, silver bluestem, prairie broomweed, and western (Cuman) ragweed. Tallgrass prairie elements may include little bluestem, big bluestem, switchgrass, heath aster, leadplant, Canada goldenrod, and gayfeather species. Woody plants such as eastern redcedar, honeylocust, pecan, common persimmon, and Chickasaw plum may be present.	218,985.6	541,124.5	1.210%	23	2
Grand Prairie: Prairie/Pasture	This type is mainly grazed or improved pasture in the modern landscape, with species such as Bermudagrass, prairie broomweed, field brome, King Ranch bluestem, silver bluestem, western (Cuman) ragweed, and Johnsongrass common. Woody species such as winged elm, Chickasaw plum, and honeylocust may be present.	17,127.0	42,321.7	0.095%	10	0
High Plains: Active Sand Dunes	This type consists of bare dunes with little vegetation.	790.0	1,952.1	0.004%	1	1

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
High Plains: Bottomland Barrens	This type consists of areas that were largely unvegetated at the time of data collection, including sand bars, mud flats, and bare rock in bottoms.	7,891.0	19,499.0	0.044%	0	0
High Plains: Bottomland Deciduous Shrubland	This type is mainly represented by successional shrublands or young woodlands in the modern landscape. Species such as black willow, Chickasaw plum, winged elm, winged soapberry, plains cottonwood, green ash, honeylocust, Siberian elm, other willow species, and other elm species may be present.	53,997.1	133,429.6	0.298%	5	6
High Plains: Bottomland Eastern Redcedar Woodland and Shrubland	This type consists of areas where eastern redcedar is the prevailing dominant. Other components may include winged elm, winged soapberry, hackberry species, green ash, willow species, and other elm species.	1,894.0	4,680.2	0.010%	0	0
High Plains: Bottomland Hardwood - Eastern Redcedar Forest	This type is represented by stands where eastern redcedar is among the most important species. Other components may include winged elm, winged soapberry, hackberry species, green ash, honeylocust, Siberian elm, willow species, and other elm species.	137.9	340.8	0.001%	0	0
High Plains: Bottomland Hardwood Forest	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Typical canopy trees include sugar hackberry, plains cottonwood, bur oak, western soapberry, boxelder, American elm, green ash, honeylocust, Siberian elm, and pecan.	183,669.4	453,856.3	1.015%	95	53
High Plains: Bottomland Herbaceous Wetland	This type in the modern landscape consists primarily of grazed pastures dominated by non-native or grazing-tolerant species. Typical components include field brome, Bermudagrass, prairie broomweed, western ragweed, cheatgrass, little barley, silver bluestem, grama species, buffalograss, and little bluestem.	48,989.6	121,055.8	0.271%	8	6
High Plains: Canyon Deciduous Shrubland	This rare type was mapped mainly in canyons of Black Mesa in highly dissected landscapes. Important woody species may include fragrant sumac, common hoptree, mountain mahogany, and one-seed juniper. Grama species, sand dropseed, and James' galleta may occur in the herbaceous layer. Soapweed yucca is a common succulent.	162.6	401.9	0.001%	0	0
High Plains: Canyon Sparsely Vegetated	This rare type was mapped in canyons of Black Mesa that were barren or sparsely vegetation, and is represented by bare slopes and rock outcrops.	17.4	43.0	0.000%	0	0
High Plains: Deep Sand Woodland	This type is mapped over aeolian and alluvial deep sands. These woodlands may have species such as western soapberry, netleaf hackberry, and American elm. Especially near drainages, eastern cottonwood may be conspicuous. Some sites may contain non-natives such as Siberian elm and black locust.	13,247.2	32,734.4	0.073%	6	12
High Plains: Depression Herbaceous Wetland	This type represents emergent marsh. Common species may include American bulrush, Torrey's rush, pale spikerush, flatsedges, cattails, and smartweeds.	686.6	1,696.6	0.004%	1	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
High Plains: Mesquite Shrubland	This type is mapped over bottomland soils and is characterized by open to relatively dense stands of mesquite in grazed grasslands. Common components in the modern landscape include field brome, cheatgrass, prairie broomweed, annual ragweed, silver bluestem, sideoats grama, blue grama, other grama species, buffalograss, plains pricklypear, and little bluestem.	16,310.2	40,303.2	0.090%	2	12
High Plains: Playa Grassland	Playas are closed, internally drained basins, mainly associated with the High Plains. Vegetation varies over time with moisture. Common dominant grasses may include buffalograss, western wheatgrass, and vine mesquite. Other grasses may include tumblegrass, foxtail barley, and annual rabbitsfoot grass. Important herbaceous species may include povertyweed, annual saltmarsh aster, and narrowleaf goosefoot.	1,260.4	3,114.5	0.007%	0	0
High Plains: Playa Marsh	Playas are closed, internally drained basins, mainly associated with the High Plains. Vegetation varies over time with moisture. Common species may include pale spikerush, hairy waterclover, flatsedges, knotweeds, wedgeleaf, and cattails.	434.7	1,074.2	0.002%	0	1
High Plains: Riparian Barrens	These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent stream scours, dry stream beds, and exposed rock.	1,225.4	3,027.9	0.007%	0	0
High Plains: Riparian Deciduous Shrubland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. This type may represent slightly moister or much wetter types than the surrounding uplands. Common species include willow species, winged elm, honeylocust, winged soapberry, sugar hackberry, ash species, and elm species.	30,182.8	74,583.2	0.167%	5	5
High Plains: Riparian Eastern Redcedar Woodland and Shrubland	This type is mapped along first and second order streams within narrow buffers, and consists of areas where eastern redcedar is the prevailing dominant. Other components may include winged elm, winged soapberry, hackberry species, green ash, willow species, and elm species.	4,679.7	11,563.7	0.026%	2	1
High Plains: Riparian Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. A wide variety of canopy trees may be important, including plains cottonwood, bur oak, sycamore, winged soapberry, Siberian elm, sugar hackberry, willow species, boxelder, elm species, gum bumelia, ash species, and honeylocust.	86,183.4	212,963.5	0.476%	34	11
High Plains: Riparian Herbaceous Wetland	This type is mapped along first and second order streams within narrow buffers, and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	1,376.3	3,401.0	0.008%	0	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
High Plains: Riparian Mixed Hardwood - Eastern Redcedar Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by stands where eastern redcedar is among the most important species. Other components may include winged elm, winged soapberry, hackberry species, green ash, honeylocust, Siberian elm, American elm, and willow species.	3,950.4	9,761.5	0.022%	4	0
High Plains: Saline Flat	This type is mapped in moist flats, often over soils derived from gypsum outcrops upstream or upslope. These areas were mainly barren at the time of data collection for this project.	5,770.1	14,258.1	0.032%	2	0
High Plains: Salt Lake Shrubland	This type is mapped on moist flats with soils often derived from gypsum upstream or upslope. Common shrubs in the modern landscape include saltcedar species, willow baccharis, and mesquite (within range). Herbaceous species similar to those described for the High Plains: Salty Grassland may be interspersed within this generally open shrubland.	1,644.5	4,063.6	0.009%	1	2
High Plains: Salt Marsh	This type is mapped on moist flats with soils often derived from gypsum upstream or upslope. Water regimes and salinity often vary over short distances, and this type may be quite patchy. Common species include American bulrush, pale spikerush, and saltgrass.	1,842.0	4,551.6	0.010%	3	1
High Plains: Salty Grassland	This type is mapped on moist flats with soils often derived from gypsum upstream or upslope. Salinity and moisture regime often vary across short distances and the type is often patchy. Common herbaceous species include saltgrass, foxtail barely, alkali sacaton, annual rabbitsfoot grass, western ragweed, southern annual saltmarsh aster, weeping lovegrass, and salt heliotrope. Saltcedar species, mesquite (in range), and willow baccharis may be present.	4,850.1	11,984.9	0.027%	0	1
High Plains: Sand Prairie	This type is mapped over aeolian or alluvial deep sands. Common herbaceous species in the modern landscape include little bluestem, sand bluestem, switchgrass, sand dropseed, sand lovegrass, sandburs, western ragweed, field brome, cheatgrass, Bermudagrass, and giant sandreed. Common shrubs include sand sagebrush, Chickasaw plum, Havard shin oak (within range), and soapweed yucca.	351,966.6	869,727.0	1.944%	49	51
High Plains: Sandhill Shinnery Shrubland	This type is mapped over aeolian and alluvial deep sands where Havard shin oak is the prevailing dominant. Taller Havard shin oak/post oak hybrids may be present, and in some areas, blackjack oak may be present. Sand sagebrush, fragrant sumac, soapweed yucca, Chickasaw plum, and netleaf hackberry are common components. Little bluestem, sand dropseed, switchgrass, sand bluestem, and sandbur species are common grasses.	47,314.4	116,916.2	0.261%	8	45

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
High Plains: Sandhill Shrubland	This type is mapped over aeolian and alluvial deep sands where woody species other than Havard shin oak are the prevailing dominants, although it may be present, within range. The type often occurs interspersed with grasslands. Common species in the modern landscape include sand sagebrush, fragrant sumac, Chickasaw plum, sand bluestem, sand dropseed, cheatgrass, western ragweed, soapweed yucca, grama species, Schweinitz flatsedge, yellow sundrops, and annual buckwheat.	137,255.1	339,164.3	0.758%	38	50
High Plains: Sandy Deciduous Shrubland	This type is over or near sandy soils, but not mapped on deep sands. Components of the High Plains: Sand Prairie such as sand sagebrush, soapweed yucca, Chickasaw plum, little bluestem, sand dropseed, sand lovegrass, sandburs, western ragweed, field brome, cheatgrass, and Bermudagrass are common. However, components associated with deep sands such as sand bluestem and giant sandreed are generally lacking.	59,790.8	147,746.1	0.330%	15	23
High Plains: Shortgrass Prairie	This type is mapped over a broad range of generally medium-textured soils of the High Plains, and grades into Central Mixedgrass types to the east. Grazing-tolerant species such as blue grama, buffalograss, sand dropseed, broom snakeweed, soapweed yucca, and Opuntia species are common in the modern landscape. Mid grasses such as little bluestem, sideoats grama, and silver bluestem are often important. Other common herbaceous species may include plains blackfoot and Rocky Mountain zinnia. Sand sagebrush, white sagebrush, and soapweed yucca are common woody components.	637,366.3	1,574,963.9	3.521%	95	63
High Plains: Tallgrass Prairie	This type is mapped over soils that are well-watered in bottoms in the High Plains. Mowed hay meadows may be dominated by grasses such as big bluestem, yellow Indiangrass, switchgrass, western wheatgrass, and little bluestem. In the modern landscape, this type may be grazed, and can be dominated by a variety of grazing-tolerant grasses and forbs such as Bermudagrass, cheatgrass, brome species, grama species, and buffalograss.	3,186.9	7,875.1	0.018%	3	0
Open Water	This type was open water during all seasons at the time of data acquisition for the current classification (circa 2012).	330,377.5	816,379.3	1.825%	10	5
Osage Plains: Tallgrass Prairie/Pasture	This type circumscribes a variety of mainly grazed grasslands, but some native hay meadows are also represented. In the modern landscape, non-native and grazing-tolerant species such as Bermudagrass, tall fescue, field brome, western (Cuman) ragweed, prairie broomweed, and sericea lespedeza are common. Some areas have native tallgrass elements such as little bluestem, switchgrass, big bluestem, heath aster, and Canada goldenrod. Woody elements may include common persimmon, eastern redcedar, sugar hackberry, elm species, and honeylocust.	812,104.1	2,006,749.8	4.486%	189	7

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Ozark-Ouachita: Dry Mixed Oak - Evergreen Woodland	This type is characterized by a mix of eastern redcedar (mainly north, in the Ozarks) or pine species (mainly south, in the Ouachitas) and oaks, and is often successional or a result of past disturbance. Common deciduous tree species include post oak, white oak, black oak, black hickory, chinkapin oak, blackjack oak, black walnut, sugar hackberry, and slippery elm.	13,805.5	34,114.0	0.076%	2	1
Ozark-Ouachita: Dry Oak Woodland	This common and broadly circumscribed type is mapped on upland flats and moderate slopes. Common tree species include post oak, white oak, black oak, blackjack oak, black hickory, other hickory species, slippery elm, sugar hackberry, and black walnut. Shortleaf pine or eastern redcedar may also be components in low density.	654,607.8	1,617,568.7	3.616%	144	33
Ozark-Ouachita: Dry Oak Woodland Young Regrowth	This type is mapped on relatively dry site types and represents mainly disturbed areas and may include pastures, forest edges, and clear-cuts where young pines have been planted, although these areas could not be identified as having been clear-cut between 2000 and 2012. Young trees and successional shrubs characterize the type. Common woody species include post oak, black oak, blackjack oak, hickory species, winged elm, slippery elm, common persimmon, sassafras, black cherry, redbud, eastern redcedar and sumac species. Vines such as poison ivy, Virginia creeper, greenbrier species, and blackberry species are common.	14,076.4	34,783.6	0.078%	5	4
Ozark-Ouachita: Dry-Mesic Mixed Oak - Evergreen Forest	This type was mapped over slopes >20% and on low flats below hills or mountains. Composition is similar to the Ozark-Ouachita: Dry-Mesic Oak Forest type, with the addition of shortleaf pine (or loblolly pine, mainly in the south) as a common component. These mainly closed-canopy forests may contain white oak, hickory species, black oak, northern red oak, and chinkapin oak as important species. This type may also include areas where forestry practices have increased the dominance of pine.	40,915.2	101,103.5	0.226%	4	0
Ozark-Ouachita: Dry-Mesic Oak Forest	This type was mapped over slopes >20% and on low flats. Closed-canopy forests with species such as white oak, hickory species, black oak, northern red oak, and chinkapin oak are characteristic of this type. The most mesic areas may contain sugar maple as an important component. Flowering dogwood, redbud, hophornbeam, and sassafras are common woody understory species.	322,587.6	797,130.2	1.782%	72	8
Ozark-Ouachita: Dry-Mesic Oak Woodland Young Regrowth	This type is mapped on relatively mesic site types and represents mainly disturbed areas and may include pastures, forest edges, or clear-cuts where young pines have been planted, but these stands could not be identified as having been cut between 2000 and 2012. Young trees and successional shrubs characterize the type. Common woody species include post oak, black oak, white oak, chinkapin oak, blackjack oak, hickory species, winged elm, slippery elm, common persimmon, sassafras, black cherry, redbud, and sumac species. Vines such as poison ivy, Virginia creeper, greenbrier species, and blackberry species are common.	7,081.2	17,498.0	0.039%	1	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Ozark-Ouachita: Montane Stunted Oak Woodland	This type is mapped at the highest elevations of the Ouachita Mountains in Latimer and LeFlore counties. Gnarled white oaks often dominate the sites, with post oak, blackjack oak, black hickory, and mockernut hickory also present. Other woody components include white fringetree, hophornbeam, common serviceberry, and Blue Ridge blueberry.	426.2	1,053.2	0.002%	0	0
Ozark-Ouachita: Pasture/Prairie	This type circumscribes broad variation, but in the modern landscape most representatives are grazed pastures. Common species are non-native and grazing tolerant grasses and forbs such as Bermudagrass, tall fescue, annual ragweed, field brome, purple top tridents, sericea lespedeza, prairie broomweed, and sneezeweed. Less heavily grazed areas may support grasslands with species such as little bluestem, big bluestem, and yellow Indiangrass. Woody species such as post oak, black walnut, common persimmon, winged elm, sumac species, and eastern redcedar may be components.	388,110.5	959,040.4	2.144%	129	10
Ozark-Ouachita: Riparian Barrens	These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands, riverbeds, and stream edges.	58.6	144.9	0.000%	0	0
Ozark-Ouachita: Riparian Deciduous Shrubland and Young Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Stream gradient tends to be relatively high, and species such as hazel alder, river birch, willow species, sycamore, and oaks may grow near steep banks or adjacent to stream bed cobble.	2,242.3	5,540.9	0.012%	0	0
Ozark-Ouachita: Riparian Evergreen Woodland and Shrubland	This type is mapped along first and second order streams within narrow buffers, and shortleaf or loblolly pine (mainly Ouachitas), or eastern redcedar (mainly Ozarks), may be the prevailing dominant. Other species such as sycamore, river birch, sweetgum, maples, oaks, and hazel alder may grow near steep banks or adjacent to stream bed cobble.	16,113.1	39,816.3	0.089%	5	0
Ozark-Ouachita: Riparian Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Stream gradient tends to be relatively high, and species such as sycamore, river birch, sweetgum, maples, oaks, and hazel alder may grow near steep banks or adjacent to stream bed cobble.	79,975.7	197,624.0	0.442%	25	2
Ozark-Ouachita: Riparian Herbaceous Wetland	This type is mapped along first and second order streams within narrow buffers, and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	424.1	1,047.9	0.002%	0	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Ozark-Ouachita: Riparian Mixed Evergreen - Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Shortleaf or loblolly pine (mainly Ouachitas), or eastern redcedar (mainly Ozarks), is a major component. Other species such as sycamore, river birch, sweetgum, maples, oaks, and hazel alder may grow near steep banks or adjacent to stream bed cobble.	17,700.3	43,738.3	0.098%	3	1
Ozark-Ouachita: Shortleaf Pine - Oak Forest	This type includes mixed stands of shortleaf or loblolly pine and oaks, and includes more natural stands as well as areas that are more intensively managed for forest products. These areas had generally not been clear-cut in the period from 2000 to 2012. Important trees may include post oak, black or mockernut hickory, black oak, white oak, northern or southern red oak, and blackjack oak. Common understory species may include flowering dogwood, hophornbeam, winged elm, St. Johnswort, and farkleberry.	277,833.9	686,541.5	1.535%	49	18
Pine Plantation	This type consists mainly of loblolly pine plantations, although shortleaf pine is also planted. These areas were mature enough to be dominated by pines at the time of satellite data collection (circa 2012).	216,846.3	535,838.1	1.198%	24	15
Pine Plantation - 1 - 3 meters	This type consists of young pine plantations that were not mature enough to be clearly dominated by pines at the time of data collection (circa 2012).	59,106.0	146,053.8	0.326%	4	14
Planted Non-native and/or Native Grasses	Grasslands or pasture typically planted with native grasses such as sideoats grama or little bluestem. Non-native grasses such as yellow bluestem or weeping lovegrass may be dominant or present.	507,456.2	1,253,949.6	2.803%	48	64
Pleistocene Sands: Blackjack Oak - Eastern Redcedar Woodland	This type is mapped on deep, aeolian or alluvial sands and is characterized by woodlands with fairly low tree diversity that contain blackjack oak among the dominants. Post oak may be present in the eastern part of the range of the type, and Havard shin oak may occur as an undstory component within its range. Eastern redcedar is often an important component. Other woody components may include gum bumelia, western soapberry, netleaf hackberry, American elm, black locust, and Siberian elm. Common shrubs include skunkbush sumac, Chickasaw plum, and sand sagebrush.	21,945.6	54,228.7	0.121%	5	34
Pleistocene Sands: Blackjack Oak Woodland	This type is mapped on deep, aeolian or alluvial sands and is characterized by woodlands with fairly low tree diversity that contain blackjack oak among the dominants. Post oak may be present in the eastern part of the range of the type, and Havard shin oak may occur as an understory component within its range. Other woody components may include gum bumelia, western soapberry, netleaf hackberry, American elm, black locust, eastern redcedar, and Siberian elm. Common shrubs include skunkbush sumac, Chickasaw plum, and sand sagebrush.	36,731.0	90,764.2	0.203%	17	18

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Post Oak Savanna: Pasture/Grassland	This type is mainly represented by grazed pastures dominated by non-native and grazing-tolerant species in the modern landscape. Common components include Bermudagrass, field brome, tall fescue, western (Cuman) ragweed, purpletop tridens, and silver bluestem. Woody components may include post oak, winged elm, Osage orange, pecan, honeylocust, water oak, and eastern redcedar.	119,156.2	294,441.0	0.658%	24	2
Post Oak Savanna: Post Oak - Eastern Redcedar Sandyland Woodland	This type is mapped over more or less deep sands and is characterized by generally open woodlands where eastern redcedar is a significant component. Common trees include post oak, blackjack oak, sugar hackberry, southern red oak, hickory species, and water oak. Shrubs may include winged elm, farkleberry, and flowering dogwood.	74.6	184.2	0.000%	0	0
Post Oak Savanna: Post Oak - Eastern Redcedar Woodland	This type is characterized by woodlands with eastern redcedar as a significant component. Common trees include post oak, blackjack oak, sugar hackberry, water oak, southern red oak, and hickory species. Shrubs may include winged elm, farkleberry, and flower dogwood.	830.6	2,052.3	0.005%	0	0
Post Oak Savanna: Post Oak Sandyland Woodland	This type is mapped over more or less deep sands and common trees include post oak, blackjack oak, water oak, southern red oak, and hickory species. Open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.	1,351.5	3,339.6	0.007%	0	0
Post Oak Savanna: Post Oak Woodland	This type is characterized by woodlands dominated by species such as post oak, blackjack oak, water oak, hickory species, pecan, cedar elm, and sugar hackberry. Shrubs may include gum bumelia, American beautyberry, possumhaw, flowering dogwood, and farkleberry.	35,035.1	86,573.6	0.194%	4	0
Post Oak Savanna: Sandyland Shrubland and Grassland	This type is mapped over more or less deep sands and in the modern landscape if most often characterized by grazed pasture with non-native and grazing-tolerant species such as Bermudagrass, tall fescue, annual ragweed, and sandbur species. Some areas with deeper sands may contain species such as little bluestem, Florida snake-cotton, pinweed, southern jointweed, and Alabama supplejack. Vines such as eastern poison ivy and greenbriar species are common.	2,888.4	7,137.4	0.016%	0	0
Post Oak Savanna: Young Woodland Regrowth	This type represents pastures and woodland edges with sparse successional vegetation. Common woody species include winged elm, post oak, water oak, blackjack oak, common persimmon, honey locust, Osage orange, black hickory, eastern redcedar, and pecan. Herbaceous areas generally have non-native and grazing tolerant species such as Bermudagrass, field brome, tall fescue, purpletop tridens, and silver bluestem. Vines such as eastern poison ivy and greenbriar are common.	653.6	1,615.0	0.004%	0	0
Quarry	This type is mapped where evidence of quarries, with bare ground, was present, only in the eastern half of the state.	7,516.6	18,573.9	0.042%	2	1

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Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Row Crops	This type includes all cropland where fields are fallow for some portion of the year. Some fields may rotate into and out of cultivation frequently, and year-round cover crops and tame hay fields are generally mapped as grassland/pasture types.	2,878,196.6	7,112,167.8	15.899%	329	27
Ruderal Deciduous Shrubland and Young Woodland	This type is mapped on prairie soils across much of the state and consists of mainly successional young woodlands or shrublands, although some more natural communities may occur. Common components vary from region to region, and may include honeylocust, winged elm, black locust, post oak, blackjack oak, pecan, Chickasaw plum, western soapberry, common persimmon, green ash, sumac species, hackberry species, elm species, and Osage orange. Eastern redcedar is not a major component of these communities but may be present.	164,504.4	406,498.5	0.909%	26	45
Ruderal Deciduous Woodland	This type is mapped on prairie soils across much of the state and consists mainly of relatively closed woodlands that vary a great deal in composition. Common woody species may include hackberry species, pecan, green ash, other ash species, elm species, honeylocust, black locust, catalpa, western soapberry, oak species, winged elm, and Osage orange. Eastern redcedar may be a component.	345,434.6	853,586.1	1.908%	85	50
Ruderal Eastern Redcedar Woodland and Shrubland	This type is mapped on prairie soils across much of the state, and ranges from relatively dense woodlands to more open shrublands where eastern redcedar is a significant component. Common woody components vary by region, and may include hackberry species, winged elm, other elm species, green ash, other ash species, honeylocust, black locust, western soapberry, lotebush, post oak, and Osage orange.	62,994.0	155,661.4	0.348%	20	18
Ruderal Mesquite Shrubland	This type is mapped over prairie soils and contains mesquite among the dominants. Other common components may include netleaf hackberry, lotebush, *Opuntia* species, cheatgrass, broom snakeweed, prairie broomweed, Bermudagrass, and sand dropseed.	8,513.2	21,036.5	0.047%	2	3
Ruderal Mixed Deciduous - Eastern Redcedar Woodland	This type is mapped on prairie soils across much of the state, and consists of relatively dense woodlands where eastern redcedar is a significant component. Common woody components vary by region, and may include hackberry species, winged elm, other elm species, green ash, other ash species, honeylocust, black locust, western soapberry, lotebush, post oak, and Osage orange.	26,084.7	64,456.6	0.144%	5	10
Ruderal Plains Shrubland	This type is mapped over prairies soils of western Oklahoma, and may contain a wide variety of shrubs and patches of trees that increase under grazing pressure. Common woody components may include species such as soapweed yucca, sand sagebrush, white sagebrush, tree cholla, Chickasaw plum, Siberian elm, sugar hackberry, and soapberry. Commonly encountered herbaceous species include broom snakeweed, plains broomweed, and short grasses such as grama species, sand dropseed, and brome species.	53,648.6	132,568.2	0.296%	6	23

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
South Central Interior: Bottomland Barrens	This type is mapped where barrens occurred in river bottoms at the time of data collection, and may include sand or mud bars, river beds, and other barren or sparsely vegetation areas.	17,853.5	44,116.8	0.099%	0	1
South Central Interior: Bottomland Eastern Redcedar Woodland and Shrubland	This type is mapped on bottomland soils where eastern redcedar is the prevailing dominant. Other components may include species such as green ash, gum bumelia, hackberry species, willow species, and elm species. Shortleaf or loblolly pine may be the dominant in the Ouachita region.	4,111.9	10,160.8	0.023%	1	1
South Central Interior: Bottomland Hardwood Forest	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common canopy dominants may include pecan, green ash, slippery elm, sycamore, sugar hackberry, honeylocust, boxelder, Shumard oak, bur oak, black willow, and American elm. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as Virginia wildrye, Indian woodoats, longleaf woodoats, Johnsongrass, Bermudagrass, and sedge species.	436,959.8	1,079,749.4	2.414%	207	9
South Central Interior: Bottomland Herbaceous Wetland	This type is mapped on bottomland soils across a variety of hydrologic regimes and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	21,354.1	52,767.1	0.118%	3	0
South Central Interior: Bottomland Mixed Evergreen - Hardwood Forest	This type is mapped on bottomland soils where eastern redcedar is among the most important species. Other components may include species such as green ash, gum bumelia, possumhaw, honeylocust, hackberry species, black walnut, willow species, and elm species. Shortleaf or loblolly pine may be the evergreen tree component, rather than eastern redcedar, in the Ouachita region.	7,509.8	18,557.1	0.041%	2	0
South Central Interior: Bottomland Shrubland and Young Woodland	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common shrubs or small trees include willow species, common buttonbush, green ash, winged elm, gum bumelia, sugar hackberry, boxelder, possumhaw, honeylocust, and black walnut. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as field brome, Bermudagrass, little barley, Johnsongrass, Virginia wildrye, and sedge species.	35,922.4	88,765.9	0.198%	12	0
South Central Interior: Riparian Barrens	This type is mapped where barrens occurred in narrow riparian areas at the time of data collection, and may include sand gravel bars, river beds, bare rock, and other barren or sparsely vegetation areas.	580.7	1,434.8	0.003%	0	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
South Central Interior: Riparian Eastern Redcedar Woodland and Shrubland	This type is mapped along first and second order streams within narrow buffers where eastern redcedar is the prevailing dominant. Other components may include species such as green ash, gum bumelia, hackberry species, willow species, and elm species.	3,087.9	7,630.5	0.017%	2	0
South Central Interior: Riparian Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common canopy dominants may include pecan, post oak, Shumard oak, green ash, slippery elm, sycamore, sugar hackberry, honeylocust, boxelder, bur oak, black willow, and American elm.	127,444.0	314,920.4	0.704%	83	2
South Central Interior: Riparian Herbaceous Wetland	This type is mapped along first and second order streams within narrow buffers, and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	2,068.3	5,110.9	0.011%	1	1
South Central Interior: Riparian Mixed Evergreen - Hardwood Woodland	This type is mapped along first and second order streams where eastern redcedar is among the most important species. Other components may include species such as green ash, gum bumelia, possumhaw, honeylocust, hackberry species, black walnut, willow species, and elm species.	4,029.8	9,957.9	0.022%	2	0
South Central Interior: Riparian Shrubland and Young Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common shrubs or small trees include willow species, common buttonbush, green ash, slippery elm, winged elm, gum bumelia, sugar hackberry, boxelder, possumhaw, honeylocust, post oak, pecan, and black walnut. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as field brome, Bermudagrass, tall fescue, little barley, Johnsongrass, Virginia wildrye, and sedge species.	15,786.1	39,008.1	0.087%	7	0
Southeastern Great Plains: Bottomland Barrens	These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands, riverbeds, and stream edges. Stream scours tend to be dynamic in space from year to year.	4,967.8	12,275.7	0.027%	0	0
Southeastern Great Plains: Bottomland Eastern Redcedar Woodland and Shrubland	This type is mapped on bottomland soils and circumscribes areas where eastern redcedar is the prevailing dominant. Other components may include species such as green ash, gum bumelia, Osage orange, honeylocust, western soapberry, hackberry species, willow species, and elm species.	646.9	1,598.5	0.004%	0	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Southeastern Great Plains: Bottomland Hardwood Forest	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common tree species include American elm, green ash, bur oak, sugar hackberry, slippery elm, black willow, sycamore, boxelder, black walnut, Shumard oak, western soapberry, and pecan. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as Virginia wildrye, Bermudagrass, Johnsongrass, field brome, Indian woodoats, longleaf woodoats, and sedge species.	85,704.8	211,780.8	0.473%	44	0
Southeastern Great Plains: Bottomland Herbaceous Wetland	This type is mapped on bottomland soils across a variety of hydrologic regimes and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	2,531.7	6,256.0	0.014%	4	0
Southeastern Great Plains: Bottomland Mixed Evergreen - Hardwood Forest	This type is mapped on bottomland soils where eastern redcedar is among the most important species. Other components may include species such as green ash, gum bumelia, possumhaw, honeylocust, hackberry species, black walnut, willow species, Osage orange, and elm species.	537.0	1,326.9	0.003%	0	0
Southeastern Great Plains: Bottomland Shrubland and Young Woodland	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common shrubs or small trees include willow species, common buttonbush, green ash, winged elm, gum bumelia, sugar hackberry, boxelder, possumhaw, honeylocust, and Osage orange. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as field brome, Bermudagrass, little barley, cheatgrass, western ragweed, Virginia wildrye, and sedge species.	7,764.3	19,186.0	0.043%	1	2
Southeastern Great Plains: Riparian Barrens	These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands and stream edges.	1,269.3	3,136.6	0.007%	0	0
Southeastern Great Plains: Riparian Eastern Redcedar Woodland and Shrubland	This type is mapped on bottomland soils circumscribes areas where eastern redcedar is the prevailing dominant. Other components may include species such as green ash, gum bumelia, Osage orange, honeylocust, western soapberry, hackberry species, willow species, and elm species.	2,153.4	5,321.2	0.012%	1	0
Southeastern Great Plains: Riparian Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. The corridors may be dominated by species such as sugar hackberry, black willow, pecan, slippery elm, green ash, post oak, sycamore, plains cottonwood, green ash, boxelder, Osage orange, or western soapberry.	39,614.9	97,890.5	0.219%	22	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Southeastern Great Plains: Riparian Herbaceous Wetland	This type is mapped along first and second order streams within narrow buffers, and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	335.1	828.0	0.002%	0	0
Southeastern Great Plains: Riparian Mixed Evergreen - Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers where eastern redcedar is among the most important species. Other components may include species such as green ash, gum bumelia, possumhaw, honeylocust, hackberry species, black walnut, willow species, Osage orange, and elm species.	1,172.5	2,897.3	0.006%	0	0
Southeastern Great Plains: Riparian Shrubland and Young Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common shrubs or small trees include willow species, common buttonbush, green ash, winged elm, gum bumelia, sugar hackberry, boxelder, possumhaw, honeylocust, and Osage orange. Vines such as eastern poison ivy, grape species, peppervine species, Virginia creeper, and greenbriar species may be conspicuous components. Herbaceous species many include species such as field brome, Bermudagrass, little barley, cheatgrass, western ragweed, Virginia wildrye, and sedge species.	4,285.1	10,588.6	0.024%	2	0
Urban High Intensity	This type consists of built-up areas and wide transportation corridors that are dominated by impervious cover.	21,359.0	52,779.3	0.118%	0	0
Urban Low Intensity	This type includes areas that are built-up or partially cleared of vegetation but not entirely covered by impervious cover, and includes most of the non-industrial areas within cities and towns.	489,168.3	1,208,759.2	2.702%	69	12
West Gulf Coastal Plain: Dry Upland Hardwood Forest	This type circumscribes forests that are mainly in a variety of states of recovery from human disturbance, and over a variety of soil moisture regimes. Common species may include white oak, southern red oak, post oak, water oak, sweetgum, hickory species, sugar hackberry, elm species, and green ash. Loblolly or shortleaf pine may be a component.	90,260.9	223,039.1	0.499%	7	11
West Gulf Coastal Plain: Large River Bottomland Barrens	These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands, riverbeds, and stream edges.	2,629.9	6,498.7	0.015%	0	0
West Gulf Coastal Plain: Large River Bottomland Deciduous Shrubland	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. They generally represent successional pastures or woodland edges,that could not be confirmed as clear-cuts based on data from 2000 to 2012. Common species may include winged elm, common buttonbush, green ash, sugar hackberry, green ash, honeylocust, baccharis species, and possumhaw.	3,198.7	7,904.1	0.018%	0	1

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
West Gulf Coastal Plain: Large River Bottomland Evergreen Woodland and Shrubland	This type is mapped on bottomland soils where loblolly pine is the prevailing dominant. These stands are commonly the result of past timber management, but these areas could not be identified as former clear-cuts based on satellite remote sensing data from 2000 to 2012. Common associated trees include sweetgum, water oak, ash species, and elm species.	1,005.4	2,484.5	0.006%	0	0
West Gulf Coastal Plain: Large River Bottomland Hardwood Forest	This type is mapped on bottomland soils across a variety of hydrologic regimes and various stages of disturbance. Common overstory trees may include water oak, pecan, willow oak, sugar hackberry, post oak, sweetgum, green ash, blackgum, slippery elm, American elm, sycamore, and black willow. Shrubs such as common buttonbush and river birch may occur in well-watered areas.	72,711.3	179,673.3	0.402%	12	20
West Gulf Coastal Plain: Large River Bottomland Herbaceous Wetland	This type is mapped on bottomland soils across a variety of hydrologic regimes and may circumscribe a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	3,914.0	9,671.6	0.022%	0	0
West Gulf Coastal Plain: Large River Bottomland Mixed Hardwood - Evergreen Forest	This type is mapped on bottomland soils where loblolly pine is among the most important species. These stands are commonly the result of past timber management, but these areas could not be identified as former clear-cuts based on satellite remote sensing data from 2000 to 2012. Common associated trees include sweetgum, water oak, ash species, and elm species.	17,947.4	44,348.8	0.099%	10	7
West Gulf Coastal Plain: Large River Bottomland Seasonally Flooded Hardwood Forest	This type includes areas that are seasonally or temporarily flooded. Common overstory species include willow oak, water oak, water hickory, American elm, slippery elm, sweetgum, and sugar hackberry. In the wettest areas of southeast Oklahoma, species such as baldcypress, overcup oak, river birch, common buttonbush, and planer tree may occur in restricted areas.	26,498.4	65,479.0	0.146%	5	2
West Gulf Coastal Plain: Northern Calcareous Prairie/Pasture	This type is mainly represented by grazed pastures with non-native and grazing-tolerant species in the modern landscape. Common species may include Bermudagrass, prairie broomweed, field brome, western (Cuman) ragweed, and Johnsongrass. Woody species such as winged elm, sumac species, possumhaw, and sugar hackberry may be present.	14,339.6	35,433.8	0.079%	0	0
West Gulf Coastal Plain: Pasture	This type is mainly represented by grazed pastures with non-native and grazing-tolerant species in the modern landscape. Common species may include Bermudagrass, little bluestem, prairie broomweed, prairie tea, tall fescue, field brome, and Johnsongrass. Woody species may include winged elm, sugar hackberry, possumhaw, green ash, and eastern redcedar.	163,443.4	403,876.7	0.903%	14	6

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
West Gulf Coastal Plain: Pine - Hardwood Forest	This type mainly represents areas that are in recovery from past timber management in the modern landscape, but could not be identified as plantations based on data from 2000 - 2012. Loblolly, or less commonly, shortleaf pines are a major component, together with species such as white oak, southern red oak, post oak, hickory species, water oak, sweetgum, and sugar hackberry. Common understory species include farkleberry, American beautyberry, flowering dogwood, and hophornbeam.	18,967.6	46,869.8	0.105%	5	3
West Gulf Coastal Plain: Pine Forest	In the modern landscape, this type most commonly represents planted loblolly, or less frequently, shortleaf pine stands, but these areas could not be identified as pine plantations based on data from 2000 - 2012. Stands were relatively mature at the time of data acquisition (circa 2012). Pines are overwhelmingly dominant, and trees such as white oak, southern red oak, sweetgum, water oak, and sugar hackberry may be present.	6,909.1	17,072.8	0.038%	0	0
West Gulf Coastal Plain: Sandhill Oak Woodland	This type is mapped over more or less deep sands and common trees include post oak, blackjack oak, water oak, southern red oak, and hickory species. Shortleaf pine may also be a component. On the deepest sands, bluejack oak may be a component, and open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.	2,209.2	5,459.0	0.012%	0	0
West Gulf Coastal Plain: Sandhill Shortleaf Pine Woodland	This type is mapped over more or less deep sands and shortleaf pine is a primary overstory component. Other trees may include post oak, blackjack oak, water oak, southern red oak, and hickory species. On the deepest sands, bluejack oak may be a component, and open stands may include herbaceous cover with species such as pinweed, Florida snake-cotton, southern jointweed, and Alabama supplejack.	73.3	181.2	0.000%	0	0
West Gulf Coastal Plain: Small Stream Barrens	These areas were essentially unvegetated during all seasons at the time of data acquisition (circa 2012), and may represent river-scoured islands and stream edges.	18.6	46.1	0.000%	0	0
West Gulf Coastal Plain: Small Stream Deciduous Shrubland	This type is mapped along first and second order streams within narrow buffers, and commonly represents successional shrublands or young woodlands in pastures. These areas could not be confirmed as clear-cuts based on data from 2000 to 2012. Common species may include winged elm, sugar hackberry, honeylocust, baccharis species, and possumhaw. Species such as common buttonbush and river birch may occur near stream edges.	737.7	1,822.9	0.004%	0	0
West Gulf Coastal Plain: Small Stream Evergreen Woodland and Shrubland	This type is mapped along first and second order streams within narrow buffers where loblolly pine is the prevailing dominant. These stands are commonly the result of past timber management, but these areas could not be identified as former clear-cuts based on satellite remote sensing data from 2000 to 2012. Common associated trees include sweetgum, water oak, ash species, and elm species.	667.8	1,650.2	0.004%	0	0

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
West Gulf Coastal Plain: Small Stream Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers, and is represented by vegetation influenced by a variety of water regimes and human impacts. Common overstory trees may include water oak, pecan, willow oak, sugar hackberry, post oak, sweetgum, green ash, blackgum, slippery elm, American elm, sycamore, and black willow. Shrubs such as buttonbush and river birch may occur in well-watered areas.	13,410.9	33,139.0	0.074%	3	0
West Gulf Coastal Plain: Small Stream Herbaceous Wetland	This type is mapped along first and second order streams within narrow buffers, and may be represented by a variety of herbaceous wetlands. Common components include sedge and rush species, spikerush species, cattails, smartweeds, and moist-soil grasses.	137.0	338.5	0.001%	0	0
West Gulf Coastal Plain: Small Stream Mixed Pine - Hardwood Woodland	This type is mapped along first and second order streams within narrow buffers where loblolly pine is among the most important species. These stands are commonly the result of past timber management, but these areas could not be identified as former clear-cuts based on satellite remote sensing data from 2000 to 2012. Common associated trees include sweetgum, water oak, ash species, and elm species. Eastern redcedar may also be an important component.	1,774.5	4,384.9	0.010%	0	0
West Gulf Coastal Plain: Small Stream Seasonally Flooded Hardwood Woodland	This type includes areas that are seasonally or temporarily flooded along narrow stream corridors. Common overstory species include willow oak, water oak, water hickory, American elm, slippery elm, sweetgum, and sugar hackberry.	2,291.8	5,663.2	0.013%	1	0
West Gulf Coastal Plains: Young Upland Hardwood Woodland Regrowth	This type circumscribes a variety of successional woodlands and shrublands in pastures or on forest edges, but does not include areas that were detected as having been logged between 2000 and 2012. Common species may include winged elm, sumac species, sugar hackberry, sweetgum, common persimmon, possumhaw, green ash, and eastern redcedar. Elements of the West Gulf Coastal Palin: Pasture type may form an herbaceous matrix.	5,437.5	13,436.3	0.030%	1	5
Wichita Mountains: Eastern Redcedar Shrubland	This type often occurs in shallow soils or in cracks in igneous granite, rhyolite, or gabbro rocks. Eastern redcedar is the prevailing dominant. The aspect can be patchy with very shallow soils or rocks exposed at the surface. Species such as post oak, blackjack oak, netleaf hackberry, gum bumelia, and little walnut may be present. Little bluestem, tall dropseed, and short grasses such as buffalograss, blue grama, and hairy grama may be important in openings.	1,393.4	3,443.1	0.008%	0	0
Wichita Mountains: Eastern Redcedar Slope Woodland	This type represents eastern redcedar-dominated woodlands on slopes >20%. Common species include netleaf hackberry, post oak, blackjack oak, Shumard oak, bur oak, chinkapin oak, American elm, and gum bumelia.	1,361.8	3,365.0	0.008%	0	3

Mapped Type Name	Brief Description	Area (HA)	Area (AC)	Percent	No. Original Samples	No. Ground truth Samples
Wichita Mountains: Eastern Redcedar Woodland	This uncommon type may occur in areas of relatively continuous or discontinuous soils, so may be more or less patchy in nature. Eastern redcedar is the common dominant, and species such as post oak, blackjack oak, netleaf hackberry, gum bumelia, and little walnut may be components.	292.5	722.8	0.002%	0	0
Wichita Mountains: Granite Outcrop	This type includes areas that were essentially barren with exposed igneous rocks in all seasons at the time of data acquisition (circa 2012). Short grasses and annual forbs may be present.	532.8	1,316.6	0.003%	0	0
Wichita Mountains: Low Stature Oak Slope Woodland and Shrubland	This type is mapped on slopes >20% and composition is similar to the Wichita Mountains: Low Stature Oak Woodland and Shrubland. Stands tend to be more closed with taller individual trees and fewer herbaceous-dominated openings.	5,562.2	13,744.4	0.031%	4	3
Wichita Mountains: Low Stature Oak Woodland and Shrubland	This type often occurs in shallow soils or in cracks in igneous granite, rhyolite, or gabbro rocks. The aspect can be patchy with very shallow soils or rocks exposed at the surface. Post oak is the most common dominant, and species such as blackjack oak, netleaf hackberry, gum bumelia, and little walnut may be present. Little bluestem, tall dropseed, and short grasses such as buffalograss, blue grama, and hairy grama may be important in openings.	5,741.6	14,187.7	0.032%	2	2
Wichita Mountains: Oak - Eastern Redcedar Slope Woodland	This type represents eastern redcedar-dominated woodlands on slopes >20%. Common species include netleaf hackberry, post oak, blackjack oak, netleaf hackberry, Shumard oak, bur oak, chinkapin oak, American elm, and gum bumelia.	172.7	426.7	0.001%	0	2
Wichita Mountains: Oak - Eastern Redcedar Woodland	This uncommon type contains eastern redcedar among the dominants, together with species such as post oak, blackjack oak, chinkapin oak, gum bumelia, netleaf hackberry, and little walnut.	113.8	281.2	0.001%	0	0
Wichita Mountains: Oak Slope Woodland	This type is mapped on slopes >20% and composition is similar to the Wichita Mountains: Oak - Eastern Redcedar Woodland type. Stands tend to be more closed with taller individual trees and fewer herbaceous-dominated openings.	4,645.0	11,478.1	0.026%	4	2
Wichita Mountains: Oak Woodland	This type most often occurs over relatively continuous soils with few openings, and is represented in a variety of land positions. Post oak is the most common dominant, followed by blackjack oak. Western occurrences may have netleaf hackberry replacing post oak as the dominant. Other species may include chinkapin oak, netleaf hackberry, gum bumelia, and little walnut. Species such as bur oak, American elm, pecan, and sugar maple may occur in more mesic areas.	6,947.7	17,168.0	0.038%	3	3
Totals		18,103,050.4	44,733,542.7	100%	3,714	1,146

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