

# Pea Ridge National Military Park Plant Survey 2006

## Wildlife Urban Interface (WUI) Data

By

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National Military Park, National Battlefield, National Battlefield Park, and National Battlefield Site are four designations for battle sites preserved by the United States federal government because of their national importance. Originally these sites were maintained by the War Department, but were transferred to the National Park Service on August 10, 1933. The different designations seem merely to reflect the mood of Congress at the time of authorization of each individual site, although “park” appears to be reserved for the larger sites. Only Brice’s Cross Roads National Battlefield Site bears that designation-others previously had, but have since been redesigned. Some battlefields are designated as National Monuments (such as Little Bighorn Battlefield National Monument) or National Historic Sites (such as Palo Alto Battlefield National Historic Site). The national Park Service does not distinguish among the four designations in terms of their preservation or management policies. As with all historic areas in the National Park System, these battle sites are automatically listed on the National Register of Historic Places.

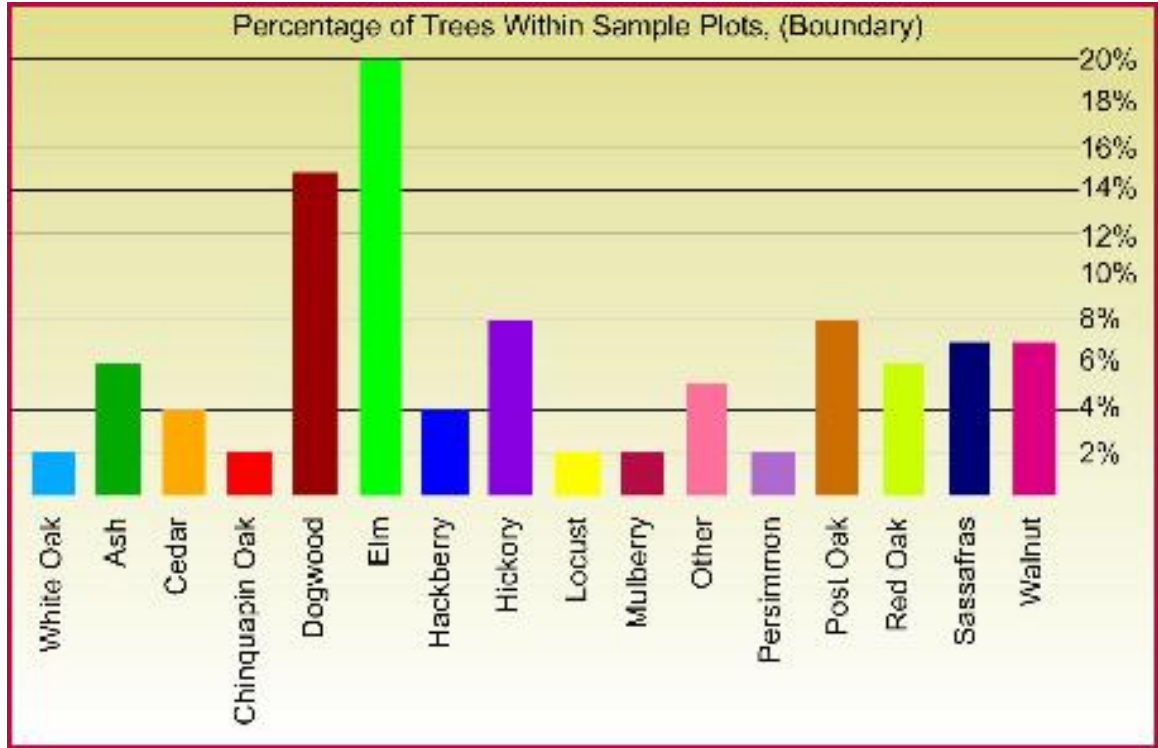
The Pea Ridge National Military Park (NMP) is dedicated to commemorating and preserving the site of the March 7 and 8, 1862 battle. The battle was a victory for the Union and helped the north gain control of the crucial border state of Missouri. Preservation and conservation has been underway for returning the Pea Ridge (NMP) to make it look as much as possible, as it was at the time of the battle in 1862. The Pea Ridge (NMP) is located in extreme northwestern Arkansas near the Missouri border. The Pea Ridge (NMP) is acknowledged as one of the best-preserved Civil War battlefields. The Pea Ridge (NMP) covers over 4,300 acres and encompasses the entire battlefield as well as a section of original earthworks constructed prior to the battle by the Federal forces. The Pea Ridge (NMP) was created by an Act of Congress in 1956 and was dedicated in 1963. The Pea Ridge (NMP) has some very unique features that some other military parks might not have. The Pea Ridge (NMP) includes a three-mile segment of the Trail of Tears. The Elkhorn tavern was used as a makeshift hospital for

soldiers of the north and the south. The Pea Ridge (NMP) also includes original remnants of the Telegraph/Military Road (a very significant road for passage prior to the war). The Pea Ridge (NMP) is administered by NPS, Department of the Interior and is also part of the Civil War Discovery Trail and the Lower Missouri Civil War Heritage Trail.

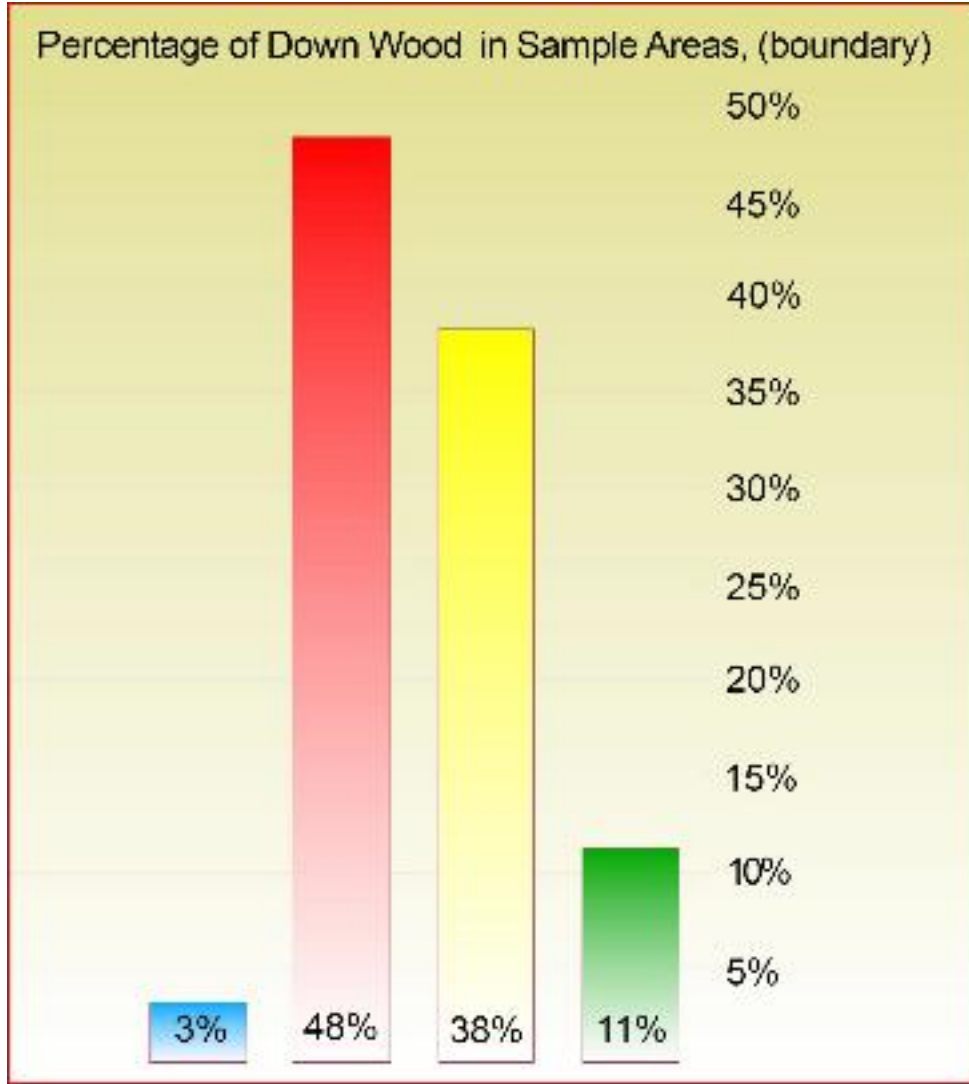
The Pea Ridge (NMP) is situated in such a part of the U.S. where winters are generally mild with average low temperatures around 35 degrees. Occasional fronts may cause extremes in low temperatures, with heavy precipitation. Summers are generally hot and humid with average highs in the 90-degree range. Fall and spring are comparable transition seasons with very comfortable temperatures and abundant precipitation. Sudden thunderstorms, lightning, hail and tornado conditions are prevalent during spring and summer weather patterns. The conditions of varying weather have a lot to do with the current growth of vegetation in the Pea Ridge (NMP).

The following methods were used to collect the data for the Pea Ridge (NMP) Wildlife Urban Interface (WUI) areas. One-tenth hectare plots were established two chains apart on transects located within the established (WUI) areas. The areas were one hundred meters wide and one transect was located approximately in the middle of the park. The plots were navigated using the geoXT data logger, a type of Global Positioning Satellite (GPS).

A total of 74 plots were surveyed, equivalent to approximately 4.144 hectares. There were 26 different hardwood species of trees within the plots surveyed. These species are listed here in alphabetical order: Ash, Basswood, Black Locust, Black Walnut, Box Elder, Cedar, Cherry, Chinquapin Oak, Dogwood, Elm, Hackberry, Hickory, Little Silver Bell, Mulberry, Orange Osage, Persimmon, Post Oak, Red Bud, Red Oak, Sassafras, Service Berry, Silver Bell, Sweet Gum, Sycamore, White Oak and Winged Elm. The percentage of trees species within all sample plots are shown in the following chart.



Down wood was classified ocularly in categories listed in the data contained in the chart below and was measured in circular plots with a radius of 10 meters. Each plot equaled approximately 0.056 hectares. Of the 74 plots sampled, 36 plots fell within the 0%-5% category indicated by the color red, 28 plots fell into the 6%-25% category indicated by the color yellow, 8 plots fell within the 26%-50% category indicated by the color green, 2 plots fell into the 51%-75% category indicated by the color blue. The following bar chart shows percentages of down wood within the sample areas.

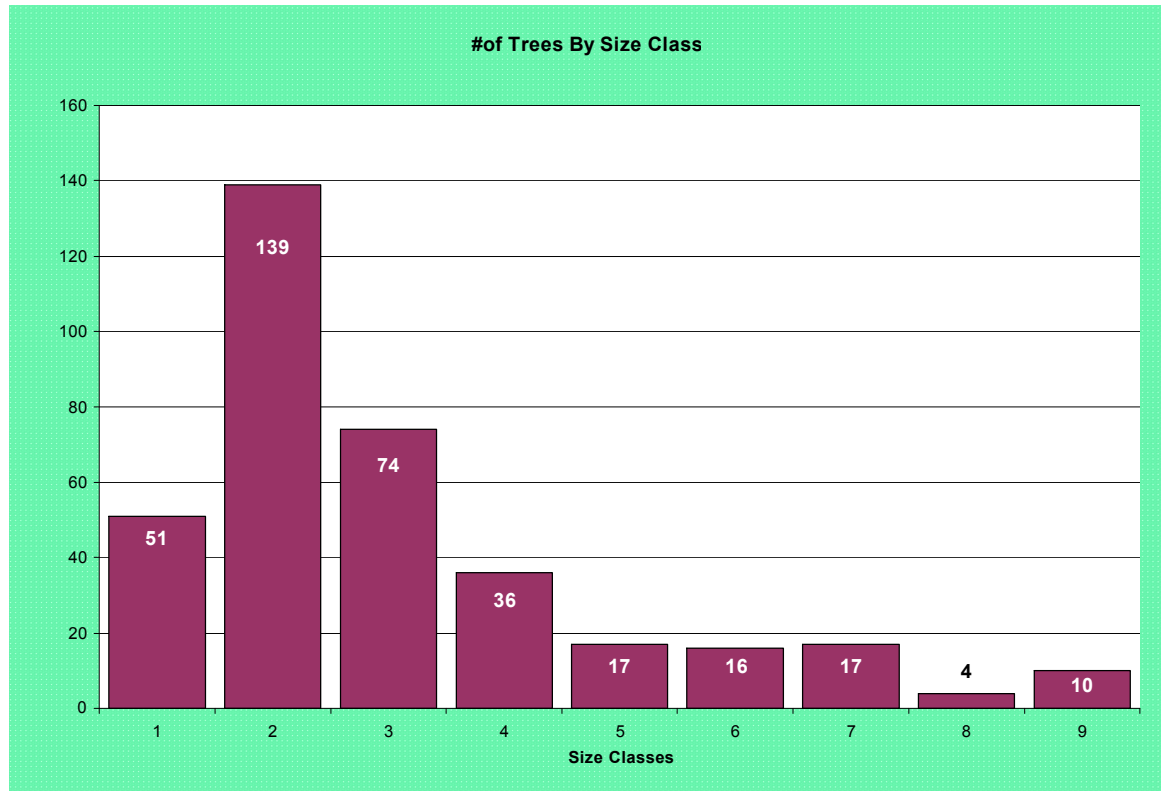


With the information provided from Pea Ridge (NMP), down wood percentages did not change from pre to post survey data.

There are 9 different size classes of trees included in the pre and post survey, as listed below:

Size Classes							
1	2	3	4	5	7	8	9
1''-2''	2''-4''	4''-6''	6''-8''	8''-10''	12''-14''	14''-16''	>16''

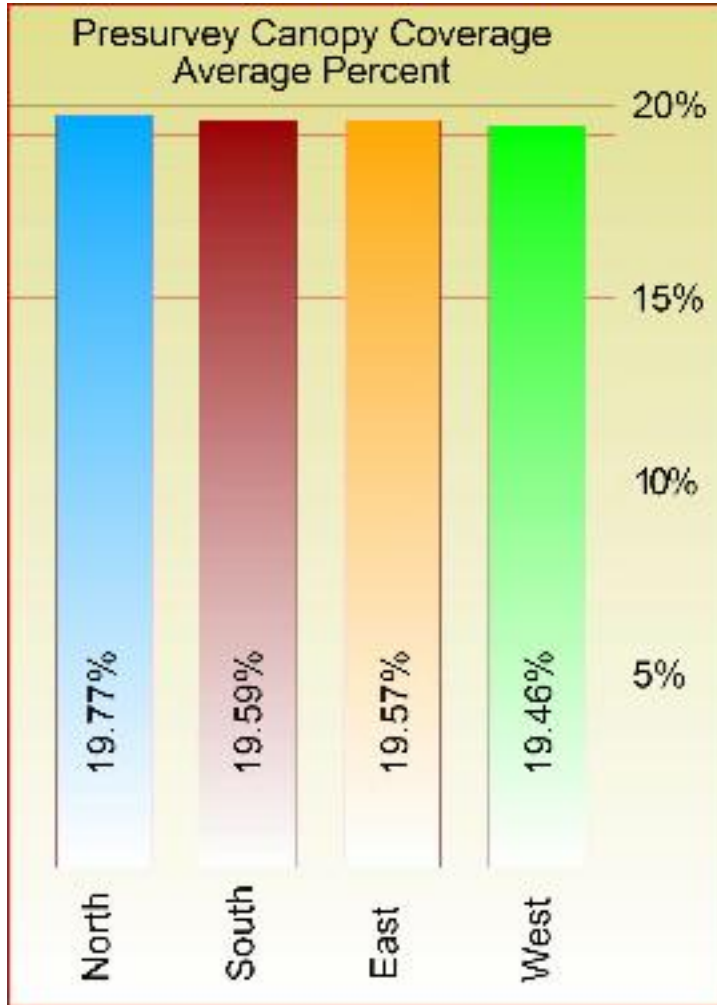
The following bar graph below represents the total number of trees that fell within each size class for all 74 plots:

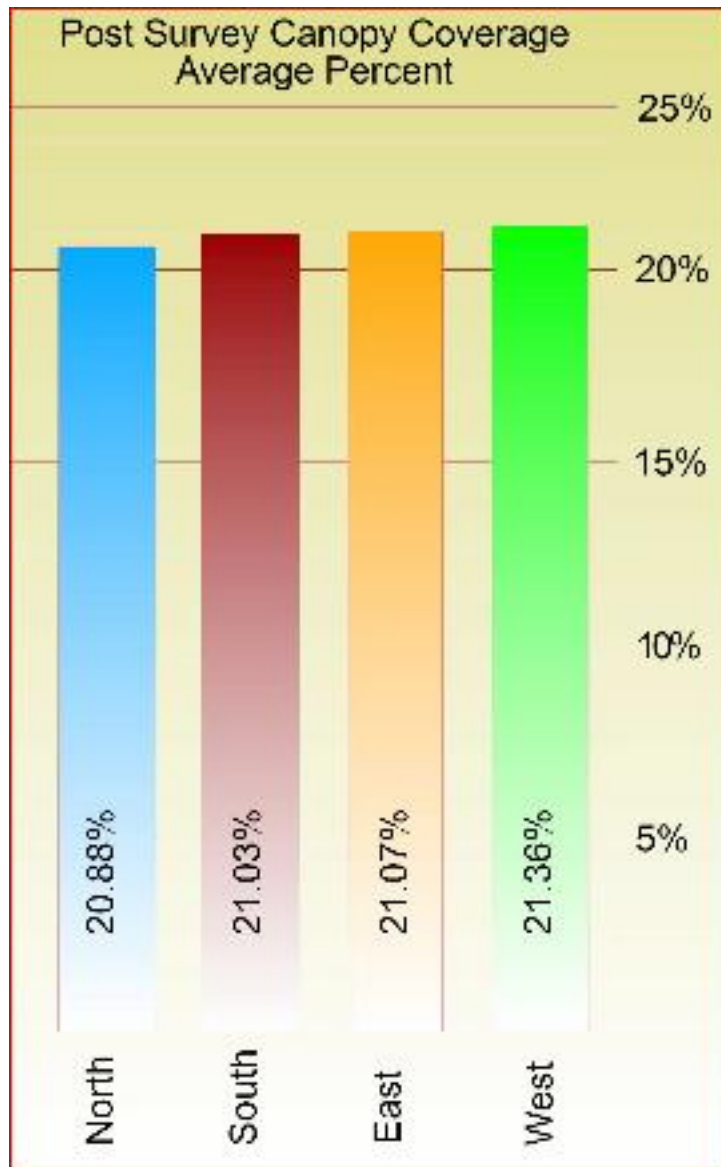


The information provided above shows that most of the trees fall into the first, second and third size classes indicating that this is a relatively “young” forest. Even fewer trees fell into the fourth, fifth and sixth size classes. Fewer still fell into the seventh, eighth and ninth size classes. Possible explanations for this include: some of the species in the fourth, fifth and sixth size classes were “undesirable” species choking out growth of “desirable” species, and/or too extensive of logging occurred. During a controlled burn the smaller and larger size classes handled the intensity of heat, allowing those species to survive.



Canopy cover is the measure of surface area that is covered by overhanging vegetation. The canopy cover was collected using a densitometer, a device used for measuring the optical density of a tree by measuring the amount of light it reflects. The trees were measured and identified to species, using a metric dbh (diameter at breast height) tape, and placed into categories.





There was approximately 3% of change of canopy coverage in the pre and post survey data provided by the Pea Ridge (NMP). It appears the average canopy coverage has increased from the pre to the post survey data.

The basal area was collected using a BAF factor 10 prism. The BAF factor 10 prism is an optical wedge instrument that simply helps determine if the ratio of dbh: the distance away exceeds the critical ratio and therefore whether the tree is within the plot and adds to the estimate of stand basal area. Basal area is a

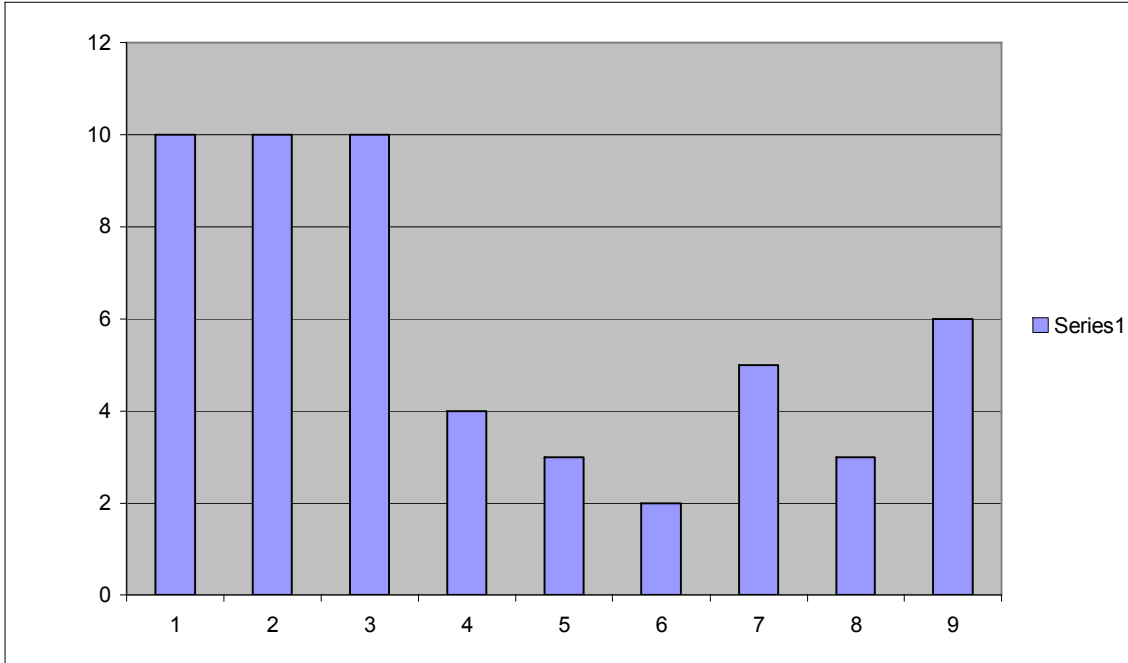
very useful parameter for quantifying a forest stand. It may be seen as a summary of the number and the size of trees in a stand. As individual tree basal area is related to tree volume, biomass, crown parameters etc., so the basal area is related to stand volume, biomass, etc. The information provided in the chart below indicates pre survey and post survey data and their averages before and after the surveys were performed.

Pre Survey Basal Area Average %	Post Survey Basal Area Average %	Difference of Pre and Post Survey Average %
Appr. 3.39	Appr. 6.66	Appr. 3.27

The presurvey basal area average was 3.39 percent versus the post survey average was 6.66 percent, meaning a difference of 3.27 percent after all data was interpreted. Elm, Dogwood and Oak were the dominant species during the pre and post survey. Size classes one, two and three had the highest numbers affecting the basal area average in the pre and post survey data.

The primary concern of Kevin Eads and the Pea Ridge (NMP) was to concentrate on all varieties of Oak species, for they were the most ample tree species during the time of the March 7 & 8 Battle of 1862.

The chart below breaks down the number of Oaks by species type within each size class per plot.



Number of Oaks per class	10	10	10	4	3	2	5
Class Number	1	2	3	4	5	6	7

In summary, there are many small species of oaks within the first three size classes and there are many species of large oaks throughout the seventh, eighth and ninth size classes. Possible explanations for this include: some of the species were “undesirable” choking out growth of “desirable” species and/or too extensive of logging may have occurred. During a controlled burn the smaller size classes are targeted but the lower intensity of the fire allowed their survival. Therefore, the number of the first three size classes remained higher than the larger size classes, which could handle a higher intensity of heat.

The information in all of the graphs and charts for all of the pre survey and post survey data were provided to me from Kevin Eads and the Pea Ridge (NMP).