

Surveying Deer on the Refuge

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An apparent browse line on the Refuge resulting from the high deer population. FWNC&R Staff Photo.

One of our responsibilities at the Fort Worth Nature Center & Refuge is land and habitat management. This includes performing a wide array of activities such as prescribed burns, brush clearing—both mechanical and chemical—and various types of surveys to assess and monitor habitat conditions and wildlife populations on the Refuge. A browse survey (or stem count index) is a commonly employed habitat appraisal method used to evaluate how white-tailed deer (*Odocoileus virginianus*) may be affecting habitat in a given area. This survey provides a quantifiable method to measure deer impacts on vegetation and can be used to assist in making sound habitat and wildlife management decisions.

When feeding, white-tailed deer choose to browse rather than graze. Browsing is a type of herbivory where animals feed on the leaves, twigs, soft shoots, fruits, and buds of woody plants. Grazing animals, such as our bison, feed primarily on grasses or other low-lying vegetation. White-tailed deer generally prefer to feed on forbs or “weeds,” which are easier to digest and provide more nutrients; however, the availability of forbs is not consistent throughout the year. Therefore, a large part of a white-tailed deer’s diet consists of woody browse species.

Browsing woody plants can have a significant impact on the habitat and plant communities of an area. Excessive browsing may lead to decreased plant vigor, increased disease susceptibility, decreased reproduction and seedling establishment, or the complete removal and loss of certain plant species. When forage availability is low for prolonged periods or when the deer population begins to exceed

the carrying capacity of the land, signs of excessive browsing may appear. One of the indicators of excessive browsing is the formation of a browse line. This occurs when the trees and shrubs have been stripped of vegetation from ground level to the maximum height a white-tailed deer can reach. A heavy browse line throughout an area may indicate poor habitat conditions and an excessive white-tailed deer population. As responsible land stewards, these are conditions we strive to avoid.

How is a browse survey conducted? Prior to performing a survey, it is important to identify the soil types and ecological sites present on the property. Carefully choosing multiple sampling locations in each significant ecological site will help ensure that a diverse number of plant species will be counted. When identifying areas to survey, animal trails or areas near water should be avoided as these highly traveled areas can skew the data.

Once the survey sites have been selected, it is time to start counting. First, with a data sheet and handheld tally counter in hand, locate a woody plant within reach of a deer and identify its palatability classification. Different browse species are classified as either 1st, 2nd, or 3rd choice depending on their palatability to white-tailed deer. The Texas Parks and Wildlife Department publishes guides identifying commonly browsed plants and their palatability classification for each ecoregion of Texas. Within each sampling area, at least three individual plants per species should be sampled until 100 stems are counted, with no more than 34 stem tips counted on any single plant.

Plants of the same species should be at least 30 to 100 yards apart. When counting stems on an individual plant, click the tally counter each time you find a stem up to approximately six feet in height that has been bitten by a deer. Deer do not have upper incisors, so the stems they bite will appear rough and frayed. Any bites that are pointed and sharp are probably the result of animals with upper incisors—rabbits, rodents, or other animals—and should not be tallied. Counting and documenting 100 stems across at least three individuals of a species is considered one “encounter.” It is preferable to conduct at least two encounters (200 stems) for each desirable species at each location.

Once all sites have been counted and documented, it is time to calculate the results. Sampled plant species are grouped by their palatability classification. The total number of stems browsed are then divided by the total number of stems counted for each individual plant species to yield a percentage of stem tips browsed for each species. All species in a palatability class can then be averaged to determine the percentage use for each palatability class. With this information, you can determine whether the habitat is being browsed at a low, moderate, or high intensity.

With the help of Texas Parks and Wildlife biologists and fellow colleagues, I conducted a browse survey on the Refuge this past winter. A total of 16 different plant species were surveyed, and 6,900 stems were counted. Some of the most common species on the property were redbud (*Cercis canadensis*), Texas red oak (*Quercus buckleyi*), corralberry (*Symporicarpos orbiculatus*), and cedar elm

(*Ulmus crassifolia*). We also counted Chinese privet (*Ligustrum sinense*), an exotic invasive shrub that commonly occurs on the Refuge. Typically, only native plant species are counted during a browse survey; however, due to the overwhelming amount of privet on the property, we included it in our survey to assess its utilization by white-tailed deer.

Results from the browse survey indicate that white-tailed deer impacts to vegetation on the Refuge are moderate to high. We also found Chinese privet to be the species most browsed by deer. Results from this browse survey also support the data derived from the white-tailed deer spotlight surveys that are conducted annually throughout the property. Spotlight survey data have indicated an estimated population of one deer per 5.86 acres on the Refuge over the previous five years, which is considered high for this ecoregion. The population has been slowly increasing over time, with a 15-year average of one deer per 6.65 acres and a 10-year average of one deer per 6.28 acres. The high abundance of non-native Chinese privet on the Refuge and its corresponding high use as a food source may currently be reducing the browsing pressure on desirable, native species. However, one of the biggest land management goals on the property for the foreseeable future is the removal and eradication of privet and other exotic and invasive species. Therefore, it raises the question: With an overabundance of deer on the property, how long do we have until we start to see greater negative impacts to native browse species once privet is reduced or removed?



With a high population, it is common to see large gatherings of deer across the Refuge. FWNC&R Staff Photo.