

Sampling to Monitor Tamarisk (Salt Cedar) Control on the Cimarron National Grassland

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Acknowledgements: Funding provided by the USDA Forest Service Pike-San Isabel National Forest. The assistance of cooperating personnel on the Cimarron National Grassland including Joe Hartman, District Ranger, Andy Chappell, Jeff Chynoweth, Dan Svingen and Mike Elson is greatly appreciated. Kiamichi Forestry Research Station personnel including Bob Heinemann, Randy Holman, Dennis Wilson, and Keith Anderson assisted in data collection.

ABSTRACT. A sampling procedure has been developed to monitor the progress of a tamarisk (*Tamarix sp.*) control program on the Cimarron National Grassland in southeastern Kansas. Tamarisk or salt cedar is an invasive exotic common to riparian areas in the southwestern U.S. Prior to application of control treatments, centers of 0.1-acre fixed-radius plots were established on a grid system in the control area. Overstory trees (primarily cottonwood (*Populus deltoides* Bartr. Ex Marsh)) and tamarisk clumps were tallied on each 0.1-acre fixed-radius plot. Line samples within each 0.1-acre plot were used to estimate tamarisk coverage on the plot. Smaller fixed-radius sub-plots were used to estimate abundance of trees smaller than 3.5-inches dbh. Millacre plots concentric to each sub-plot were used to estimate abundance of regeneration shorter than 4.5-feet tall.

KEY WORDS. Eastern cottonwood, *Populus deltoides*

INTRODUCTION

The objective was the development of a sampling framework to monitor a tamarisk (*Tamarix sp.*) control program on the Cimarron National Grassland. Additional description of the area and results from an inventory of the tree resources on the Cimarron National Grassland have been reported by Lynch and Wittwer (2002, 2003a, 2003b). Tamarisk control measures include cutting clumps with vehicular mounted saw heads, herbicide application, and burning of cut material. Efforts are being made to establish cottonwood by planting cuttings in some of the control areas. The results presented here are based on sampling conducted prior to control efforts. Additional sampling is planned subsequent to implementation of tamarisk control treatments.

METHODS

Fixed-radius plots were established along transects in tamarisk control areas and in untreated areas. GPS equipment was used to determine the location of each plot center. Metallic bolts were embedded in the soil at plot center to facilitate exact plot center locations for remeasurement. Height, diameter at breast height, crown diameter, height to crown base, and crown condition were measured on overstory trees (primarily eastern cottonwood (*Populus deltoides* Bartr. Ex Marsh)) located within each 0.1-acre fixed-radius plot. Tamarisk clumps within the plot boundaries were tallied by 3-foot height classes. Four radial line samples extending from plot center to plot boundary were used to estimate tamarisk coverage on the plot. Trees less than 3.5 inches dbh and 4.5 feet tall or taller were sampled on four 0.005-acre sub plots within each 0.1-acre plot. Within each of the four 0.005-acre sub plots, trees shorter than 4.5 feet were sampled on a 0.001-acre plot. Digital color photographs were obtained with a camera located at plot center so that the lens was pointed at a range pole located at a fixed distance in each of the cardinal directions (North, South, East and West). This will permit visual comparisons with photos taken after tamarisk control. Pre-control results are given for two tamarisk control areas on the Cimarron National Grassland that have been sampled prior to application of control treatments.

RESULTS

Figure 1 below indicates the estimated distribution of tamarisk clumps by 3-foot height classes on Area A in the Cimarron National Grassland prior to tamarisk control efforts. The 4.5 foot height class was the most abundant in this area of the Grassland.

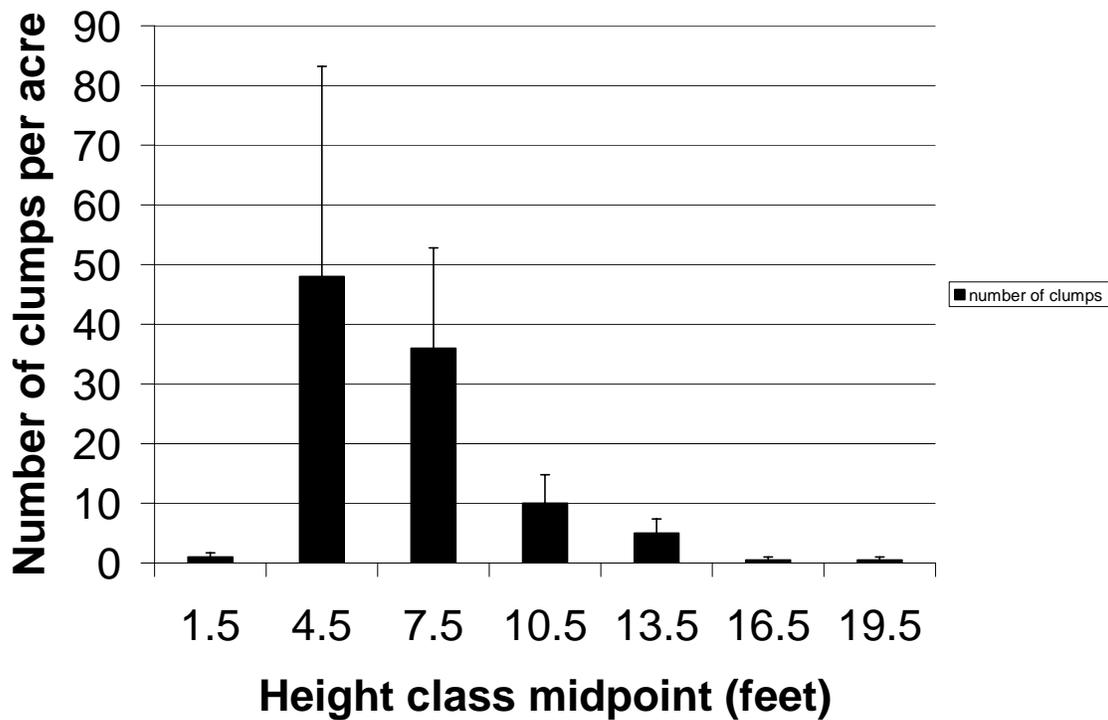


Figure 1. Number of tamarisk clumps per acre by 3-foot height class on Area A, Cimarron National Grassland.

Prior to tamarisk control area A contained an estimated 7.0 (± 5.6) cottonwood per acre larger than 3.5" dbh with 3.43 (± 2.45) square feet of basal area per acre. Estimated regeneration amounts (less than 4.5 feet tall) included 50 (± 50) cottonwood per acre and 100 (± 100) sandbar willow per acre for a total of 150 (± 109) per acre. No trees less than 3.5" tall but greater than 4.5 feet in height were counted on 0.005-acre sub plots in area A. There were 101 (± 57) tamarisk clumps per acre with a coverage of 3.5% ($\pm 1.4\%$).

Results of the tamarisk tally for plots located in the New Bridge area are summarized in Figure 2 below. In this area the 7.5 foot height class contained more tamarisk clumps than any of the other 3-foot height classes.

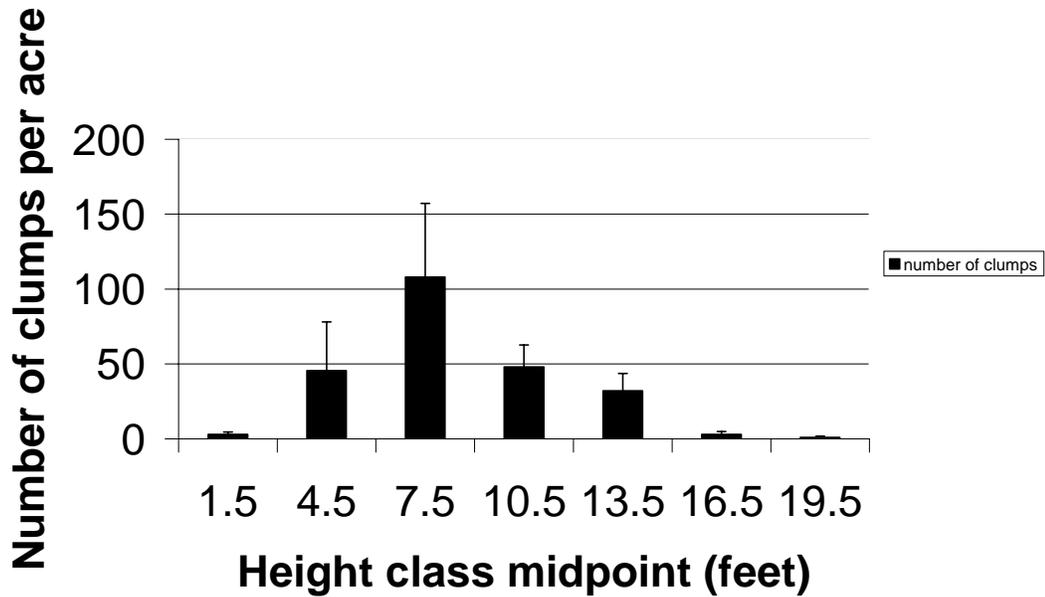


Figure 2. Number of tamarisk clumps per acre by 3-foot height class, New Bridge Area, Cimarron National Grassland.

The New Bridge area contained an estimated 17.5 (± 6.2) cottonwood per acre larger than 3.5" dbh with 10.82 (± 3.71) square feet of basal area per acre. Stem counts on millacre plots (less than 4.5 feet tall) yielded an estimate of 17.5 (± 6.2) dead cottonwood per acre. No living regeneration was counted on the millacre plots. No trees less than 3.5" dbh and greater than 4.5 feet tall were counted on the 0.005-acre sub plots in the New Bridge area. There were 237 (± 95) tamarisk clumps per acre with coverage of 10.0% ($\pm 3.0\%$).

DISCUSSION

It is intended that pre treatment results presented here will be compared with conditions after tamarisk control at one or more post treatment times. GPS technology and a metal detector should permit location of metallic bolts marking exact plot centers for each of the sample plots. Post treatment inventories at each plot should permit evaluation of vegetation changes after tamarisk control.

LITERATURE CITED

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