MDC Resource Science

Early performance of eastern redcedar seedlings after clearcutting in southwest Missouri

Science Notes

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Early performance of eastern redcedar seedlings after clearcutting in southwest Missouri

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Objective
Determine early survival and growth of eastern redcedar seedlings after clearcutting.

Summary
Rarely is redcedar managed sustainably in Missouri despite its ecological and potential economic value. Managers in southwest Missouri are interested in sustainably managing redcedar, but are uncertain about the best way to accomplish this goal. In order to fill this information gap, a pilot study was installed in a dense, redcedar stand on a south-aspect site in southwest Missouri to investigate the impacts of management options on redcedar growth and regeneration.

As part of a larger test of redcedar management, redcedars were planted in stands that had been clearcut. These plantings were established on an upper slope and lower slope in early spring 2010. Redcedar plantings were revisited in April 2011 and February 2013 to determine survival and growth. Although upper and lower slope plantings were fairly easy to delineate in 2013, planted seedlings were not tagged previously, which made it difficult to distinguish between planted and volunteer redcedar seedlings and, as a result, precluded assessment of three-year survival. We, therefore, measured 40 and 47 redcedar seedlings on upper and lower slopes, respectively, during the February 2013 visit. We subsequently tagged those seedlings for future monitoring. This report addresses the early performance of redcedar seedlings with respect to slope position in a clearcut in southwest Missouri.

Results
Survival of planted redcedar after the first growing season (2011) was 97% and 90% for lower and upper slope plantings, respectively. Mean height of redcedar seedlings planted on the lower slope (7.1 inches) was slightly greater than those planted on the upper slope (6.3 inches) after one growing season (Figures 1A & 1B). This difference in mean height between slope positions was significant according to a T-test ($p<0.05$). Three years after clearcut (2013), mean height and basal diameter of redcdear seedlings were significantly greater on the lower slope (32.6 and 0.45 inches, respectively) than upper slope (24.1 and .33 inches, respectively). Compared to 2010 mean heights of planted seedlings, 2013 seedling populations were on average 4-times taller on the upper slope and 5-times taller on the lower slope, which were both highly significant differences.

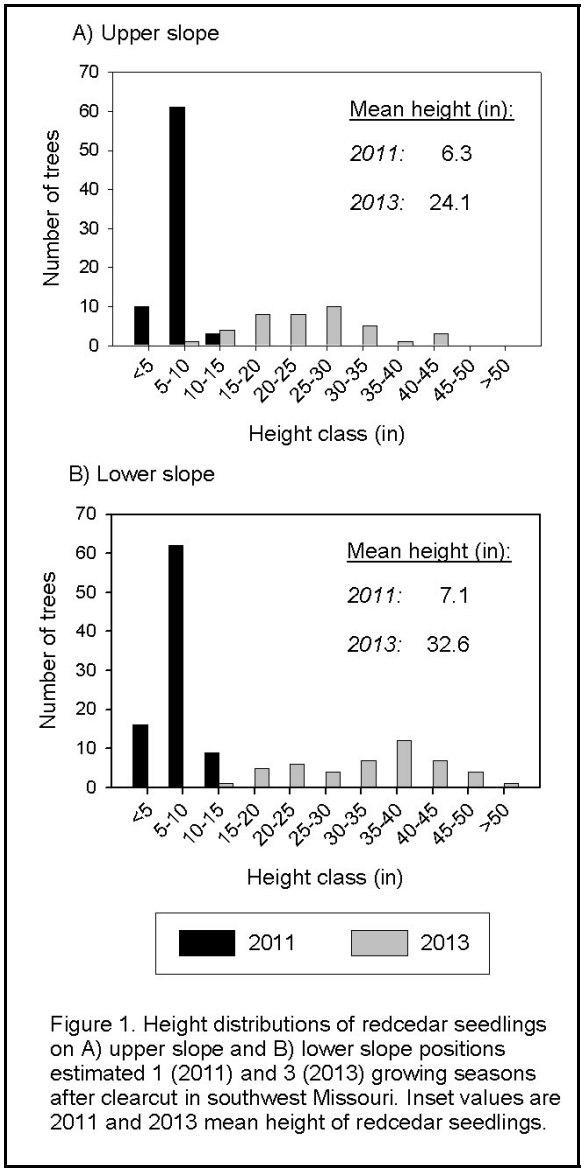

Figure 1. Height distributions of redcedar seedlings on A) upper slope and B) lower slope positions estimated 1 (2011) and 3 (2013) growing seasons after clearcut in southwest Missouri. Inset values are 2011 and 2013 mean height of redcedar seedlings.

Management Implications
Although we were unable to fully evaluate the performance of planted seedlings after three growing seasons, the results of this investigation revealed at least two insights, including: 1) high first-year survival (at least 90%) regardless of slope position and 2) higher first-year survival and average seedling height one and three growing seasons after clearcutting on the lower slope. This second finding was likely due to elevated soil moisture on the lower, less exposed portion of the slope. However, ensuring that the future stand is dominated by redcedar will likely require timely follow-up treatments to release redcedar from faster-growing, broadleaf competitors.

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