Effects of linear woody vegetation removal on grassland birds at Bartel Grasslands

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ABSTRACT: Woody edges, including linear tree rows, are known to negatively impact grassland bird populations due to many species avoidance of these features as well as their negative impacts on breeding bird nesting success. Because of these effects, management guidance for grassland birds often includes recommendations to control or remove woody vegetation. Although widely recommended, data regarding grassland bird response to woody vegetation removal are presently scarce. I report on a study that documents breeding bird response to the removal of over 4-km of linear tree rows from a 150 ha grassland site in northeastern Illinois – the Bartel Grasslands. Tree line removal appeared to have a relatively strong impact on breeding bird populations at the site. Populations of several grassland bird species, especially Bobolink, Savannah Sparrow, and Grasshopper Sparrow showed an immediate increase the first year following tree removal at the site. Bobolink numbers increased by 24% at the site, Savannah Sparrow numbers increased by 47%, and Grasshopper Sparrow numbers were three times more abundant at the site in the initial year following tree removal. For all three of these species, population increases were greatest in the portions of the site where the tree lines formerly occurred. Tree removal also appeared to result in the elimination of several bird species typically associated with trees and/or shrubland areas of the site. This is one of the first studies to show that populations of grassland birds may increase as a result of tree line removal and suggests that tree line removal may be an effective way to increase local populations of grassland birds.

Savannah Sparrow numbers increased after removal of woody vegetation at Bartel Grassland.

This photo of a Savannah Sparrow was taken at Montrose, Cook County 23 September 2010 by Steve Spitzer.

KEYWORDS: Grassland Restoration, Grassland Birds, Grassland Management, Woody Vegetation Management

INTRODUCTION

Grassland bird populations have declined significantly over the last 30 years in nearly all geographic areas of North America (Sauer et al. 2004). Because of these population declines, many grassland birds have been identified as species of management concern (e.g., U. S. Fish and Wildlife Service 2002). A common response to species population declines is often to seek to acquire more habitat (O'Leary and Nyberg 2000). Such an approach, however, may divert attention away from more challenging questions concerning whether existing lands are effectively addressing the needs of declining species (O'Leary and Nyberg 2000).

For grassland birds, one important habitat consideration is the presence of edges. There is increasing evidence that many grassland birds avoid habitat edges (e.g., Delisle and Savidge 1996, Helzer 1996, Fletcher and Koford 2003, Bollinger and Gavin 2004). In particular woody edges appear to exert a strong influence on grassland bird populations, reducing bird abundance and nest density, and increasing rates of nest predation and nest parasitism (Johnson and Temple 1986, 1990, Winter et al. 2000, Jensen and Finck 2004, Bollinger and Gavin 2004).

Linear woody tree lines cutting through grassland areas also have negative effects on grassland birds (O'Leary and Nyberg 2000, Bollinger and Gavin 2004). O'Leary and Nyberg (2000) showed that grassland bird territories and nests tended to occur on the interior of grasslands and that birds avoided setting up territories or placing nests in the vicinity of linear tree rows cutting through grassland areas, and Bollinger and Gavin (2004) found a tendency for Bobolink abundance and nest success to be lower near linear woody hedgerows than in more open areas.

Because of the negative effects of these woody features on breeding grassland birds, management guidance for grasslands often includes recommendations to remove or reduce woody elements (e.g., Sample and Mossman 1997, O'Leary and