

Development and Distribution of Applied Research on Grazing Regimes and Biodiversity in Alberta

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Key Points

- Good Pasture Health and sustainable management are important in maximizing the economics of the grasslands as well as maintaining other important land-use objectives like wildlife productivity and biodiversity.
- Avoid over-grazing wetland and riparian areas and if possible limit grazing in these areas to maintain the wildlife productivity of these areas.
- Retention of grasslands at the landscape level is important and provides benefits for the conservation of prairie birds and other wildlife.

Introduction

Grazing management regimes employed by producers directly impact the sustainability and productivity of land for forage production, wildlife, diversity of species, water quality and conservation, and air quality. Significant research has been completed focusing on forage production. However, little work has been completed in Alberta investigating the effects of grazing management regimes on both forage production and biodiversity. Recently, three research projects, lead respectively by the University of Alberta, the University of Manitoba and Montana State University, evaluated the effect of grazing systems on forage production, subsequent beef production and biodiversity as measured by native and migratory bird productivity in two biomes in Alberta. This data is valuable to extension professionals and producers in addressing production objectives and the principles of rangeland, riparian and agroforestry management. Often, the useful information from research studies like these is never made available to resource managers. The research data was synthesized and various communication products and extension tools were developed to extend this information to producers throughout Alberta.

A brief summary of the three research studies is included below with some of the interesting findings in regards to grazing and wildlife/biodiversity management.

Effects of cattle grazing on upland nesting duck production in the Aspen Parkland. – J. Warren, 2004

The objective of this M.Sc. study was to evaluate relationships between intensity of cattle grazing and two different aspects of annual duck production: (1) field-specific nest abundance, and (2) field-specific nesting success.

This study was conducted during 2001 and 2002 on pastureland in the western portion of Alberta's aspen parkland. Each field was classified according to amount of shrub cover present and pasture health. Duck nest success in wetlands and uplands was monitored throughout the nesting season.

The results of this study document a complex relationship between cattle grazing, duck nest density, and nest success. The study did demonstrate that pasture health, resulting from current and long-term historical grazing management, has long-term impacts on duck nest density. Fields that had high pasture health generally had higher density of duck nests than those with lower pasture health ratings. Highest net production occurred in idled or lightly grazed fields and decreased as grazing intensity progressed through moderately and heavily grazed fields. Warren recommends that for maximizing duck production, range health, and the economic benefits of cattle production, managers should strive for a grazing regime that results in light to moderate grazing intensities. Heavy grazing should be avoided.

Effects of cattle grazing on breeding wetland birds in the Aspen Parkland of Alberta. – R. Stavne, 2004

The objective of this M.Sc. study was to investigate (1) breeding species richness, (2) nest density, and (3) daily survival rates of wetland bird nests in relation to cattle grazing intensity in Alberta's Aspen Parkland.

This study occurred during 2001 and 2002 on the same study area used by Warren (western Aspen Parkland). Species diversity per wetland ranged from 1 to 18 wetland bird species in 2001 and from 1 to 20 species in 2002. The amount of field-level residual cover positively affected bird species richness and there was a positive correlation between bird species richness and the amount of grassland within one kilometer of the study area.

Songbirds showed a strong preference for wetlands in moderately grazed native pastures but in tame pastures they had equally high densities in wetlands within both moderately and heavily grazed pastures. Nests in wetlands situated in moderately grazed pastures had lower success than those in idled/lightly grazed or heavily grazed pastures. Breeding wetland bird species richness is highest in wetlands that are situated in or adjacent to pastures that have higher residual cover in early May. Heavy grazing disrupts breeding efforts of wetland birds through reduction of suitable nesting habitat, decreased nest concealment, concentration of nests and, potentially, density-dependent nest predation. Stavne recommends moderate grazing of uplands and only infrequent periods of light to moderate grazing of wetland areas followed by a significant rest period, as might be achieved through rest-rotation grazing. Wetlands may need to be fenced off from grazing in extreme situations where sensitive nesting cover is consistently damaged.

Upland nesting ducks as surrogate species for avian conservation in the dry mixed-grass prairie. – N. Koper, 2004

The objective of this PhD. study was to evaluate the potential for ducks to be surrogate species for avian conservation in the dry mixed-grass prairie including,

- Evaluation of the effects of habitat management for ducks on duck and songbird richness and on duck, songbird and shorebird relative abundance,
- Evaluation of whether duck productivity would be a good surrogate for productivity of other avian species, and

- Comparison of the effects of landscape characteristics on ducks and songbirds.

This study was conducted during 2000 to 2002 near Brooks, Alberta, on dry mixed-grass prairie fields (range of 11 to 3230 ha) that contained managed wetlands. Fields were either idle (no grazing within 2 – 15 years), had grazing deferred until after July 15, or were grazed early in the season (May 31 to July 15).

Distribution of upland species was unaffected by grazing management. Among species that showed response to field size, upland species tended to select larger fields while wetland species selected smaller fields. Overall, the effect of grassland patch size may be more important than field size. Distance to different habitats strongly influenced distribution of upland birds. Ducks had higher nest success in deferred fields than in either idled or early grazed fields, and tended to have higher success in larger fields. Songbird nest success was independent of grazing treatment, although success for savannah sparrows and western meadowlarks was higher in larger fields.

Ducks are not effective as surrogate species for avian conservation in the dry mixed-grass prairie of southern Alberta and habitat management for ducks should not be assumed to encompass the needs of co-existing species. However, preservation of grasslands on the landscape will provide benefits for the conservation of all prairie birds even though ducks, songbirds and shorebirds select different nest site microhabitats. Focusing management efforts on local vegetation characteristics and edge effects would influence distribution and nest success of most ducks (except mallards and perhaps gadwall to a lesser extent) and songbirds more than managing landscape level characteristics, although grassland loss and fragmentation may impact prairie bird species by increasing the amount of roads and grassland edge on the landscape. Range management that increases vegetation height while maintaining moderate litter depth, and provides nesting habitat in large fields far from roads and water may increase nest success of both ducks and songbirds.

Conclusion

The overall results from these studies re-affirms that industry standards/recommendations in regards to grazing management and pasture health is a good proxy for measuring the health of wildlife habitat and biodiversity values. As a result, new informational products and landowner programs have been developed consistent with the outcomes of the research including:

- Ducks Unlimited Canada's new grazing and forage incentive programs
- Alberta NAWMP's – Biodiversity Self Assessment Guide for landowners
- Natural Advantage Program- Biodiversity Planning project
- "Increase Biodiversity on you Farm" factsheet
- Environmental Goods & Services support

For more information on these products and programs please email me.

References

Koper, N. 2004. Upland-nesting ducks as surrogate species for avian conservation in dry mixed-grass prairie. Ph.D. Thesis. University of Alberta, Edmonton, Alberta. 192 pp

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