Abstract. Proc. of the 24th Sunflower Research Workshop. January 17-18, 2002.

LANDSCAPE EFFECTS ON BREEDING BLACKBIRD ABUNDANCE AND SUNFLOWER DAMAGE IN THE SOUTHERN DRIFT PLAINS OF NORTH DAKOTA

RYAN L. WIMBERLY[1], GEORGE M. LINZ[2], WILLIAM J. BLEIER[3], AND H. JEFFREY HOMAN[2]

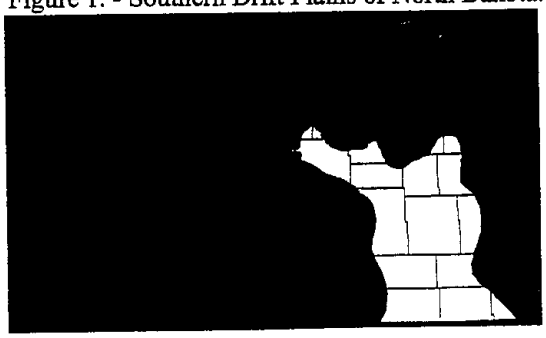
[1]USDA/APHIS/Wildlife Services, Bismarck, North Dakota 58501
[2]USDA/National Wildlife Research Center, Bismarck, North Dakota 58501
[3]North Dakota State University, Fargo, North Dakota 58105

Introduction

Breeding bird surveys have been conducted over a 28-year span in the Prairie Pothole Region (PPR) of North Dakota. Over this time, breeding populations of blackbirds have remained relatively stable. In 1996, county-level blackbird surveys were initiated by the National Wildlife Research Center. Overall, blackbird numbers peaked in 1997 and 1998 with approximately 25.7 breeding pairs/quarter section (64.8 ha), more than two times greater than breeding pairs in 1990. Blackbirds were 33% more prevalent in 1998 and 1999 than in 1996 and 1997. During this same time period, comprehensive sunflower damage assessments were conducted in four counties of the PPR in North Dakota and South Dakota. Damage pooled across counties averaged 2.2% and was valued at $764,000 or $8.68/ha.

Changes in local habitat variables, particularly the availability of cattails in wetlands, may have a pronounced influence on the annual stability of populations of breeding blackbirds. This dynamic may influence the effectiveness of effective blackbird damage management techniques. To date, the National Wildlife Research Center has relied on tracking blackbird populations at regional and county levels to infer population trends. Current research is focusing on describing the statistical relationships between numbers of breeding blackbirds and habitat variables in the Southern Drift Plains (SDP) of North Dakota (Figure 1). Based on the five-year average of sunflower production, the top ten counties in sunflower production lie entirely or partially within the SDP of North Dakota.

Figure 1. - Southern Drift Plains of North Dakota.



Methods

A total of 240 quarter sections (64.8 ha) were randomly selected in the SDP of North Dakota. Breeding blackbird surveys were conducted on all 240 quarters from 18 May through 30 May 2001. Blackbird surveys were conducted using two person crews. Adult male blackbirds were recorded according to seven habitat categories. Habitat categories included wetlands, shelterbelts/woodlots associated with a residence, shelterbelts/woodlots with no residence, upland, pasture, cultivated field, and roadside habitat. Adult male red-winged blackbirds (*Agelaius phoeniceus*), yellow-headed blackbirds (*Xanthocephalus xanthocephalus*), and common grackles (*Quiscalus quiscula*) were recorded during the survey.

Sunflower damage assessments were conducted from 20 September to 28 September 2001. All 240 quarters surveyed for breeding blackbirds were also surveyed for the presence of sunflower fields. Due to the lack of sunflowers in the randomly selected quarter sections, sunflower damage assessments were extended to include sunflower fields located in the same section (259 ha). Under these guidelines, 32 sunflower fields were surveyed for damage caused by blackbirds. Sunflower fields were divided into four strata with single transects conducted in each stratum. A total of five sunflower heads were surveyed at each point along a transect.

Aerial color infrared photographs were taken of each of the 240 quarters from 09 August to 12 August 2001. Photographs were taken vertically at approximately 1500 meters. Digital images of quarter sections were created by scanning 35-mm slides and analyzed using geographical information system software. The digital images were analyzed for coverage of wetlands, woodlots, pasture, cultivated lands, and farmsteads. Habitat availabilities will be determined by planimeter measurements on geo-referenced, spatially-corrected digital images of the 240 quarter sections. Differences in habitat characteristics among quarter sections will be determined using ANOVA techniques.

Results

In 2001, blackbird damage to sunflower was estimated to be 5.6% in the SDP of North Dakota. Sunflower production loss to producers was estimated to be $2.5 million. Results from the blackbird surveys indicated red-winged blackbirds (RWBL) and yellow-headed blackbirds (YHBL) were most commonly observed in wetlands (Figure 2). Common grackles (COGR) were most common in shelterbelts at residences.

On average, 16.6 adult male RWBL were observed per quarter. Adult male YHBL were observed on average of 16.1 per quarter, while 4.2 male COGR were observed per quarter. Adult male blackbirds observed per quarter totaled 36.9 individuals. Thus, the breeding population in the SDP of North Dakota is estimated to be 73.8 breeding pairs per quarter.

Discussion

Blackbird depredation continues to be a major concern with sunflower producers in North Dakota and South Dakota. Statewide sunflower damage caused by blackbirds has been estimated to be $5-10 million in the sunflower growing region. To better understand blackbird population dynamics in the PPR, the impact of changes in habitats over time must be understood. Changes in the availability of cattails and other habitat variables may have pronounced influences on blackbird populations. Due to the large scale, the influence of habitat availability on breeding populations in the PPR may overwhelm small-scaled impacts that may result from blackbird damage management techniques. The effects of local habitat variables and climate variations on breeding blackbird populations must be quantified before a comprehensive population model can be developed.

The first year of this two-year project was completed in 2001. Research will continue in the same 240 quarter sections in 2002. Breeding blackbird surveys will continue in 2002 along with sunflower damage assessments. Research will continue to focus on describing the statistical relationships between numbers of breeding blackbirds and habitat variables in the SDP of North Dakota. These data will be used to assess relationships among sunflower acreage and habitat variables. Our objective is to design a practical monitoring program for assessing changes in blackbird numbers and bird damage to sunflower.

Figure 2. - Mean Number of Adult Male Blackbirds Observed Per Habitat

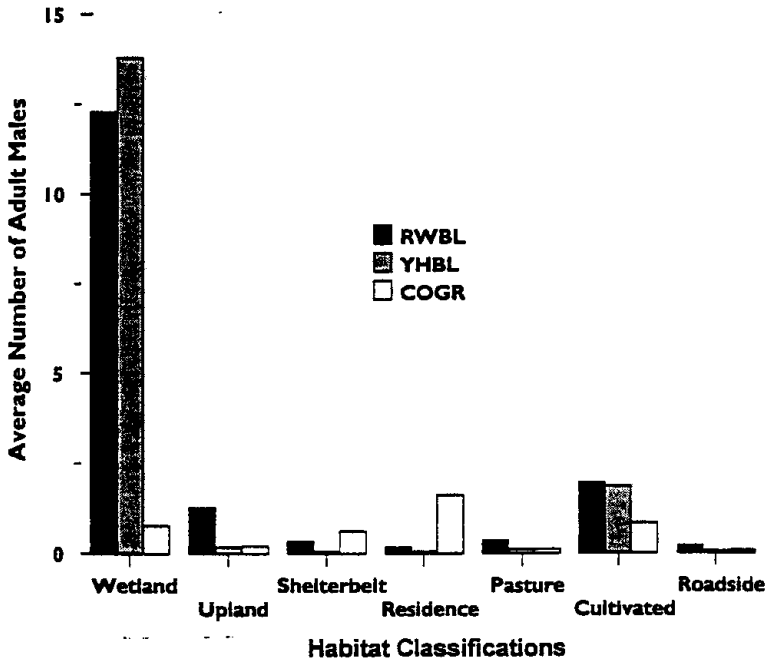
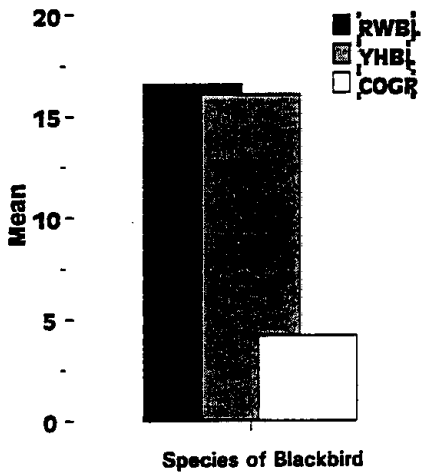


Figure 3. - Mean Adult Male Blackbirds per Quarter Section



Proceedings of the 24th

SUNFLOWER RESEARCH WORKSHOP

January 17-18, 2002

Sponsored by:

National Sunflower Association

The 2001 Sunflower Research Workshop, sponsored by the National Sunflower Association, took place on January 17 and 18, 2002, at the Ramada Plaza Suites, Fargo, ND. The workshop was very well attended and received by public and private researchers from the United States and Canada, as well as other interested parties.

This volume contains nearly all the presentations given at the 2001 workshop. Some of the papers are summarized or abstract form.

The National Sunflower Association would like to extend its appreciation to those presenting papers/posters at this annual Sunflower Research Workshop and to those who participated by their attendance and questions. Special thanks are extended to the NSA Research Forum Planning Committee, Dr. Gary J. Brewer, NDSU, Dr. Laurence D. Charlet, USDA-ARS and Pat Duhigg, Seeds 2000. Thanks also to Gerald Seiler, USDA-ARS-NCSL, Burton Johnson, NDSU, and Bob Benson, Mycogen Seeds for their expertise in moderating the workshop sessions.

Questions regarding these proceedings may be directed to the National Sunflower Association, 4023 State Street, Bismarck, ND 58503.

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