NORTH DAKOTA GAME AND FISH DEPARTMENT

Final Report

# A Landscape Approach to Grassland Bird Conservation in North Dakota

Project T-1-3

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# Project Report - 2004

## A LANDSCAPE APPROACH TO GRASSLAND BIRD CONSERVATION IN THE PRAIRIE POTHOLE REGION OF THE NORTHERN GREAT PLAINS

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Project Description: The goal of this project is to develop breeding bird models/maps which link bird population density to local and landscape habitat features. Maps/models will be used to guide management decisions by predicting landscape capability to attract grassland birds, determining treatments required to meet habitat requirements, and predicting improvement in bird population status. This project is part of a large, multi-state (MN, IA, SD, ND, MT) effort to conserve grassland birds throughout the Prairie Pothole Region of the U.S. This report summarizes our progress to date, with the promise of providing final mapping products and publications (and annual December updates to all partners) in 2007. **Funding and/or in-kind contributions for this work total $1,413,300 over 5 years (2002-07; Table 1 lists partners).**

Table 1. Funding partners

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| North Dakota Game and Fish Department |
| Minnesota Department of Natural Resources |
| Neotropical Migratory Bird Conservation Act |
| Region 3 HAPET Office (Minnesota) / U.S. Fish and Wildlife Service |
| Region 6 HAPET Office (North Dakota) / U.S. Fish and Wildlife Service |
| University of Montana |
| Iowa State University |
| Iowa Department of Natural Resources |
| The Nature Conservancy |
| Wildlife Habitat Management Institute |

Work Completed in 2002: **In 2002 we procured funding, hired 2 graduate students and conducted a pilot field season.** Funding and match contributions have all been contracted through the University of Montana. The two graduate students are Frank Quamen (PhD student at the University of Montana) and Shane Patterson (MS at Iowa State University with Rolf Koford). In 2002, Frank and Shane conducted a pilot field season in northwest North Dakota (Frank) and west central Minnesota (Shane). Objectives of the pilot season were to 1) evaluate optimal time of day and seasonal timing for surveys, 2) investigate how long individual surveys should be conducted, 3) evaluate bird detectability issues to settle on a suitable radii for fixed-point counts, 4) finalize vegetation measurement protocols and most importantly 5) evaluate how many times to visit individual points.

To address these questions, we surveyed birds (for 15 minutes each) at 42 points (21 in ND, 21 in MN) 7-8 times 10 May – 25 July. An equal number points were located in idled and native grazed grasslands, and haylands. Visits were staggered according to time of day and Julian date. Data plots indicated that surveys in 2003 be conducted from sunrise to 1000 hours 15 May – 4 July to coincide with peak bird activity. Pilot data also indicated that surveys be conducted for 10 minutes, a time that coincides with most other published literature. Program DISTANCE output indicated that distance information be collected for each bird surveyed out to 100 m from the center of the point. After removing point count data that fell outside these criteria, we conducted Monte-carlo simulations on the remaining data to ask the question "Is it better to survey a few points many times or should we sample more points once?". This is a key question in estimating sample sizes, evaluating whether we could adequately cover the study area with sample points and still detect enough individuals to construct landscape models for a suite or 16 species. Pilot season data indicate that a large number of sites must be visited to detect rare species of highest management concern (e.g., detections are low for Sprague's Pipit, Baird's Sparrow, Chestnut-collared Longspur). Data further indicate that on average, detection rates increased <5% for rare species when sites were visited twice (versus once). For more abundant species (e.g., Savannah Sparrow, Bobolink, Clay-colored Sparrow), detection rates on average increased 9-11% when sites were visited twice. Clearly, a large number of sites must be visited to ensure enough detections to construct models for species that are less than common (10% occurrence rate is our target). Using this information, we maximized sample size in 2003 by surveying a large number of sites once (n = 1,384), and small sub sample of sites twice (n = 85) in Minnesota to further investigate this sampling question.

Work Completed in 2003 and 2004: **Work completed in 2004 closely mirrors that of 2003 and is our second of three field seasons. This season, we surveyed an additional 1,335 sites (536 in North Dakota; Figure 1), bringing our total to 2,719 sites.** We constructed our sampling design using satellite imagery, contacted over 3,000 landowners to gain access to private lands, hired 9 field technicians and completed surveys at 1,384 sites in 2003 and 1,335 sites in 2004. Biologists from HAPET offices in Regions 3 (Diane Granfors, Fergus Falls, MN) & 6 (Mike Estey, Bismarck, ND) partnered with us to locate sample points. Point locations are stratified by geographic region, area of grassland in landscape and habitat type. We used wetland management

districts to distribute points proportional to district area. Within districts, we buffered each 30-m pixel of land cover to estimate total grassland area (i.e., all types of perennial herbaceous vegetation) within a 2 km buffer. Total grassland area in the landscape was used to embed points into high, medium and low grassland landscapes. Points in North Dakota also were stratified into 3 habitat types in following proportions: grassland (60%), haylands (30%) and agricultural lands (10%). All points within a habitat type are spaced >2 km apart to maximize spatial independence.

Simple random sampling of points in agricultural landscapes yields little information about bird use of the few remaining grassland landscapes. Thus, an equal allocation of points among landscapes with 0-100% grassland cover is necessary to maintain confidence intervals in regression analyses. With the aid of remotely sensed land cover, we have achieved an equal allocation of sample points that will allow us to incorporate total grassland area as a predictor of grassland bird distribution and abundance. We plotted the distribution of our sample and that of the Breeding Bird Survey data (for the same study area) against total grassland area. Although landscapes with >20% grassland area are less abundant, our sampling design allows us to sample these with equal intensity.

Once the sample was completed, we contacted landowners via telephone and mail to gain access to points on private lands. We maintain a database of how many landowners granted access, their geographic location, and reasons for negative responses. In 2004, >90% of landowners granted access. We hired 9 field technicians to conduct bird surveys. We also established a Memorandum of Understanding with the U.S. Fish and Wildlife Service. Essentially, the Service provided 10 vehicles for use in this study. In return, the study paid for fuel and maintenance costs. The study also purchased pro-rated liability insurance through the University of Montana to cover technicians (no accidents occurred).

We procured additional funding from the Natural Resources Conservation Service (NRCS) in 2004. These funds will allow us to conduct a full third field season. In addition we will use a portion of this grant to conduct 3 regional workshops to train NRCS field staff how to use our decision support tools in implementing grassland bird habitat conservation on the ground.

We added an additional component to our project to address the issue of planted treebelts in grassland landscapes. In the transition zone between tallgrass and mixed-grass prairie, we conducted transect counts at 12 locations (eight grassland sights with bordering treebelts and four control grassland sites without trees). We placed 5 transects at 50m intervals from trees in each of the 8 treebelt sites, and compared grassland bird density to distance from treebelt (Figure 2). This fall, trees were removed from 4 of the 8 sites in an experimental manipulation. We will conduct counts again in 2005, and have submitted a proposal to secure funding from the South Dakota Department of Game, Fish and Parks to triple our study sites.

We completed the 2004 field season in July, and have returned vehicles to their respective U.S. Fish and Wildlife Service offices. 2003 data have been entered, and we are currently entering data from the 2004 field season into spreadsheets. In September, we presented at The Wildlife Society Conference in Calgary, Alberta. Our presentation, entitled "Of Ducks and Dickey Birds: Conservation Planning for Multiple Taxa" highlighted the ways in which models from our study will be combined with those already produced for waterfowl. We will send annual updates before the end of the year to all partners and final products will be delivered in 2006-07 at project's end. Please contact David Naugle with questions.

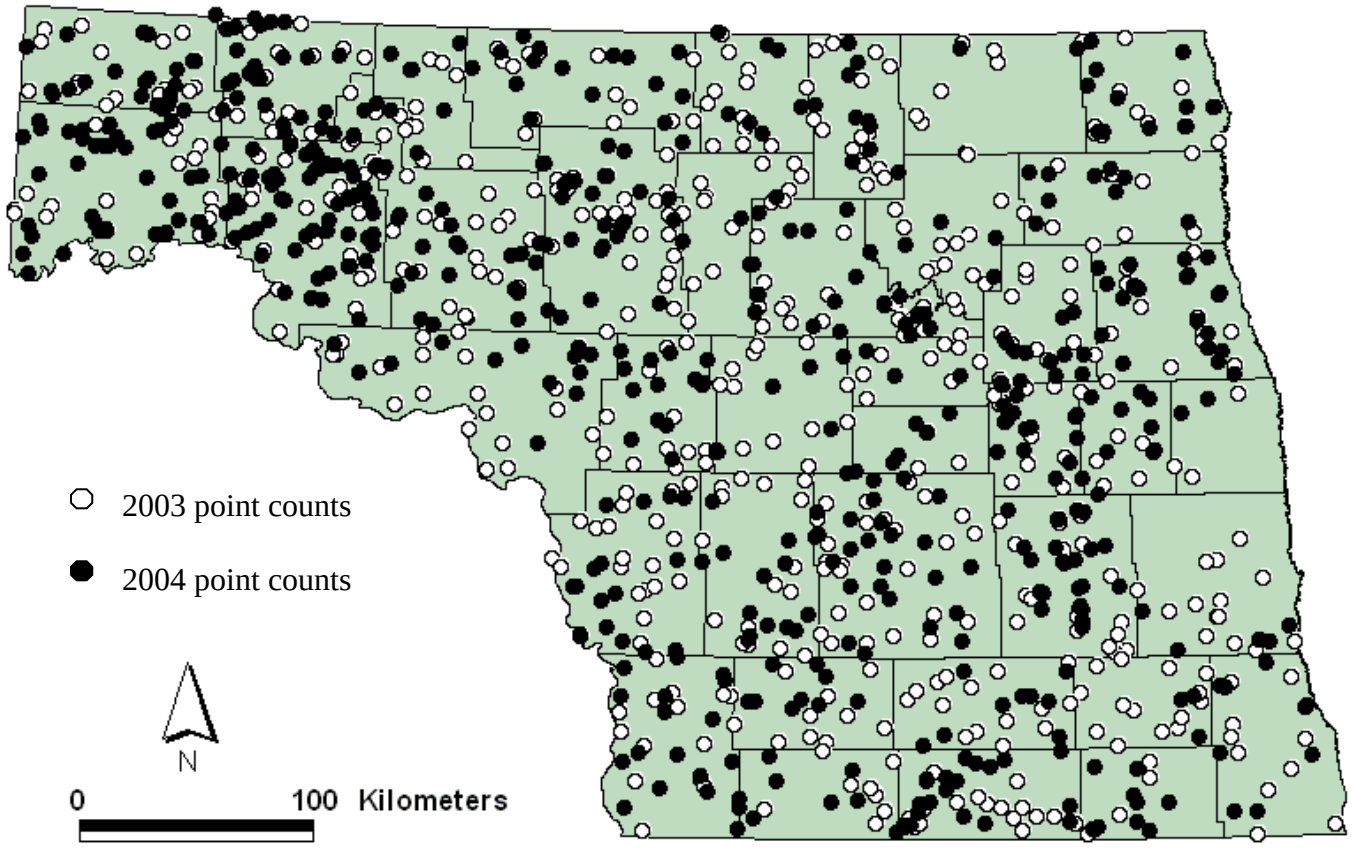


Figure 1. Grassland bird point count locations in North Dakota in 2003 and 2004.

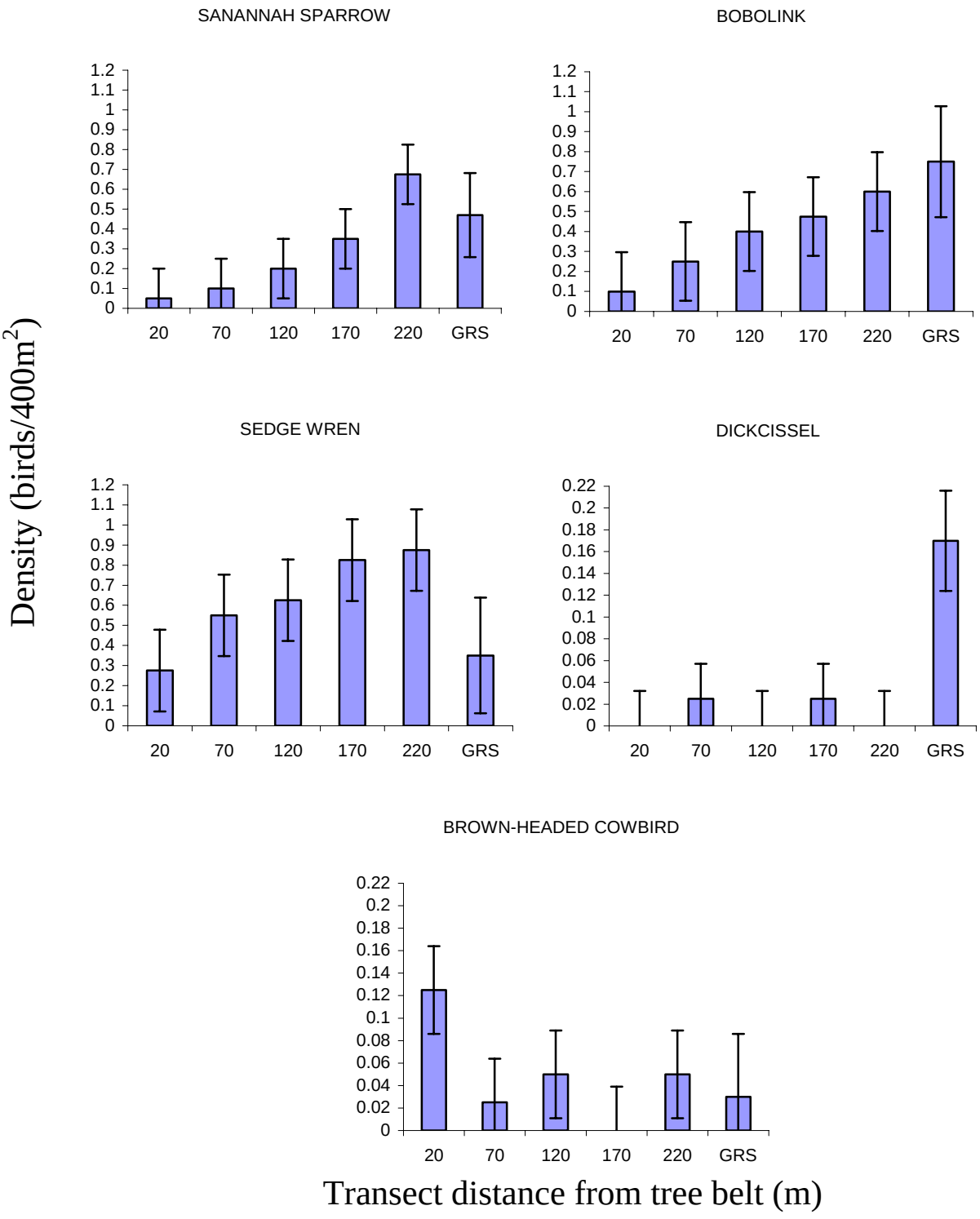


Figure 2. Densities of birds detected on 100m transects at differing distances from tree belts and in grasslands without shelter belts (GRS) in tallgrass/mixed-grass transition zone 2004.