Grassland Bird Surveys in Support of the Michigan Breeding Bird Atlas II: Year Two Progress Report

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Cover photos: Center: Henslow's Sparrow (*Ammodramus henslowii*). Upper left: Northern Harrier (*Circus cyaneus*). Lower right: Grasshopper Sparrow (*Ammodramus savannarum).*
Henslow's Sparrow photo by Allen Chartier. Northern Harrier photo by Julie Gibson. Grasshopper Sparrow photo by Jerry Jourdan.

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ABSTRACT

Information gathered during the first Michigan Breeding Bird Atlas (MBBA) project pointed to dramatic declines among some species guilds, including grassland birds (McPeek and Adams 1991). In addition to this apparent decline, information is lacking on the distribution, abundance, breeding phenology, and habitat use of grassland birds. In 2004 the Michigan Natural Features Inventory (MNFI) proposed to conduct systematic surveys for grassland birds to provide improved data for the MBBA II. A total of 175 bird surveys were conducted during the 2005 field season. MNFI staff and volunteers conducted 131 surveys and the Kalamazoo Nature Center completed an additional 44 surveys. A total of 300 bird surveys were conducted during the 2006 field season. MNFI staff and volunteers conducted 247 surveys and the Kalamazoo Nature Center completed an additional 53 surveys. In addition, 106 incidental species observations were noted. Of these 406 locations, we detected state listed grassland bird species at 115 sites. These detections were made primarily of singing males but also included females and pairs. Numbers of individuals detected are as follows: 74 Dickcissel (*Spiza americana*), 208 Grasshopper Sparrow (*Ammodramus savannarum*), 115 Henslow's Sparrow (*Ammodramus henslowii)*, five Northern Harrier (*Circus cyaneus*), one Sharp-tailed Grouse (*Tympanuchus phasianellus*), and three Western Meadowlark (*Sturnella neglecta*). Additional state listed species were noted at some sites, including Common Moorhen (*Gallinula chloropus*), Cooper's hawk (*Accipiter cooperii*), Forster's Tern (*Sterna forsteri*), Hooded warbler (*Wilsonia citrine*), Marsh Wren (*Cistothorus palustris*), Northern goshawk (*Accipiter gentiles*), and Red-shouldered hawk (*Buteo lineatus*). Three state listed plant species were also documented including Fascicled broom-rape (*Orobanche fasciculate*), Hill's Thistle (*Cirsium hillii*), and Pitcher's Thistle (*Cirsium pitcheri*).

INTRODUCTION

The original Michigan Breeding Bird Atlas project spanned the years from 1983 to 1988, and the primary goal of the project was to map the distribution of each bird species that breeds in Michigan (McPeek and Adams 1991). Such surveys should be conducted at regular intervals (10 to 25 years) to identify range and population changes (McPeek and Adams 1991), which was the purpose for starting the Michigan Breeding Bird Atlas II (MBBA II) project in 2001.

Information gathered during the first atlas project pointed to dramatic declines among some species guilds, including grassland birds. In addition to this apparent decline, information is lacking on the distribution, abundance, breeding phenology, and habitat use of grassland birds. In 2004 the Michigan Natural Features Inventory (MNFI) proposed to conduct systematic surveys for grassland birds to provide improved data for the MBBA II. We expect that a three-year effort will be required to adequately survey the state for these species. Our objectives are to 1) provide improved data for the MBBA II project, 2) expand our knowledge of the distribution and abundance of grassland birds in Michigan, 3) collect baseline data using an accepted protocol that would allow for long-term monitoring of trends, and 4) gather information on the habitat use of grassland bird species at the landscape level. Informed management of these grasslands is required to enhance the long-term viability of native species inhabiting this ecological resource. Devising appropriate protection

and restoration strategies relies on the availability of current status assessments of environmental features and associated biota.

Grassland birds, as a group, have suffered the most severe population declines of any other birds (Herkert 1995, Herkert et al. 1996). Urban sprawl and subdivisions, changes in agricultural practices such as row cropping and early harvested alfalfa, parasitism, predation, and succession continue to threaten habitat for these birds, especially area sensitive species. Many historic grasslands are fragmented and undergoing succession to shrubland and early successional forest. Most of the existing grasslands are managed wildlife plantings and openings on state lands which have limited management funds to control woody vegetation. Many of these sites were originally designed to have increased linear edges to provide cover for gamebird species, which further fragments and isolates these habitats. None the less, these grasslands, and other public and private grasslands provide critical habitat for rare grassland birds, including area sensitive species and species of greatest conservation need, and thus hold great management potential.

This multi-year project will help public land managers and planners identify the grassland bird species, communities, and habitats of concern, both in their local areas and statewide. The first year of this project (2005) focused on public lands in the Southern Lower Peninsula (SLP) and in the Eastern Upper Peninsula (EUP). The second year of surveys (this report) was carried out at various locations throughout the Lower Peninsula (LP), and at select locations in the far EUP. With additional funding, the final year of surveys (2007) will be conducted primarily throughout the Upper Peninsula (UP) and at various sites in the LP. Most sites where state listed grassland bird species were detected during the 2005 breeding season were re-surveyed in 2006. These species include Henslow's Sparrow (*Ammodramus henslowii)*, Grasshopper Sparrow (*Ammodramus savannarum*) and Northern Harrier (*Circus cyaneus*).

It is the intention of this project to identify the most critical sites in Michigan for the continued protection of grassland birds, and to supplement the MBBAII. Several projects (MSU graduate studies, Important Bird Areas Programs, and the Michigan Breeding Bird Atlas Project) have already studied grassland birds in Michigan. Most have been limited in scope or have answered specific research questions, therefore lacking the statewide perspective needed to identify critical grasslands. New and updated inventories and ecological assessments of these grasslands will provide valuable data describing 1) the status of important resident grassland bird communities and species, 2) habitat associations of several species of greatest conservation need, and 3) conservation management needs for grassland bird species. The inventories will help to fill the information gaps that currently exist and will provide a much stronger foundation for devising sound conservation and management strategies.

The MNFI is prepared to undertake research to: 1) gather reports and other records for nesting grassland birds in grasslands throughout the state, 2) conduct targeted grassland bird surveys on public and private lands where reports and records exist and update element occurrences for these grassland bird species, 3) collect ecological data at survey sites to characterize critical habitats and communities necessary for sustaining viable populations of grassland birds in Michigan, and 4) disseminate this information to key land management partners.

This progress report presents the results of the second year of a multi-year project to conduct systematic inventories of statewide grasslands to identify critical nesting habitat for rare grassland birds. In this compilation of year two efforts, we provide the results of grassland bird inventories conducted by zoologists focused on public and private lands in the LP and the EUP. Important grassland bird species, including one state threatened, and five species of concern are depicted as 2006 detection maps.

METHODS

Study Area

The study area for this project includes grasslands within the entire state of Michigan, including the UP and LP. Ownership includes federal, state, and county, as well as non-governmental preserves and private lands enrolled in easement programs. Grassland types surveyed include both warm and cool season grass plantings, and combinations of the two, old/abandoned fields and slash cuts, young pine plantations, and grasslands associated with airports, metroparks, etc.

Point Counts

Grassland birds which are currently listed as Michigan endangered, threatened, or of special concern were the primary targets of surveys (Table 1), although all detected species were recorded. The Natural Heritage Biological and Conservation Database (BCD) was consulted for known occurrences or rare grassland birds throughout the study area. Information on various species was gathered by consulting expert ornithologists, zoologists, wildlife biologists, pertinent unpublished reports, and a variety of published sources. Survey sites for each target species or group were selected based on historical occurrence records, air photo interpretation, current land cover maps, and by consulting with individuals knowledgeable about the specific grasslands of Michigan. In addition MNFI zoologists identified potential survey sites.

Sites were surveyed at least once during the breeding season, and were initiated in late May in the SLP, and ended in very early July in the UP. We located grassland bird point count stations at least 300 m apart and 100 m from forest edge. All point count stations were off road, except when access was limited by water-filled ditches or when the effective habitat spanned both sides of a quiet gravel or dirt road. Point counts were also conducted from roadsides when sites were private-owned and owners had not responded to solicitations for permission to access.

Small grasslands (<30 ac.) were generally excluded from the survey, unless the effective habitat was larger, for example where a small grassland was flanked by adequate shrubland, marsh, or agricultural fields, or when a request was made by a landowner or agency person to survey a specific site. We conducted surveys between sunrise and approximately 10:00 am. Heavy precipitation and winds greater than or equal to 20 km/hr (13 mph, equivalent to Beaufort Scale 4) were avoided.

The point counts consisted of a ten-minute silent period in which all birds heard and/or seen within the grassland were recorded. For each observation we recorded the species, sex (if discernable), and any pertinent behavior, such as carrying food, defensive behavior, etc. Data from all sightings included numbers of individuals seen or heard and the extent and quality of

occupied habitat. These data were then entered into the BCD. In addition, for every survey point a grassland bird survey form, developed by MNFI, was completed, unless data was entered directly onto an IPAQ pocket computer Excel file.

Table 1. Target federal and state listed grassland bird species and their associated ranks.

State Listed Grassland Bird Species and Ranks						
Scientific Name	**Common Name**	**Family**	**US Status***	**State Status****	**Global Rank*****	**State Rank*****
Ammodramus henslowii	Henslow's sparrow	Emberizidae		T	G4	S2S3
Ammodramus savannarum	Grasshopper sparrow	Emberizidae	PS	SC	G5	S3S4
Asio flammeus	Short-eared owl	Strigidae		E	G5	S1
Circus cyaneus	Northern harrier	Accipitridae		SC	G5	S3
Lanius ludovicianus migrans	Migrant loggerhead shrike	Laniidae		E	G4T3Q	S1
Spiza americana	Dickcissel	Cardinalidae		SC	G5	S3
Sturnella neglecta	Western meadowlark	Icteridae		SC	G5	S4
Tympanuchus phasianellus	Sharp-tailed grouse	Phasianidae		SC	G4	S3S4

****State Status**
E = endangered
T = threatened
SC = special concern
***Federal Status**
PS = partial status (federally listed in only part of its range)
*****Ranking**
GRANK

The priority assigned by The Association for Biodiversity Information's national office for data collection and protection based upon the element's status throughout its entire world-wide range. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

G3 = either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.
G4 = apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
Q = taxonomy uncertain.
T = subspecies.
SRANK

The priority assigned by the Michigan Natural Features Inventory for data collection and protection based upon the element's status within the state. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

S1 = critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state.

S2 = imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.

S3 = rare or uncommon in state (on the order of 21 to 100 occurrences).
S4 = apparently secure in state, with many occurrences.

Vegetation Sampling

Vegetation survey forms were completed at several, but not all, 2006 survey sites either on the day of the bird survey, or later in the summer, through mid-September. Several vegetation characteristics were measured or estimated at each site, including vegetation height, vegetation density, litter layer depth, dominant grass species, grass to forb ratio, and percent shrub. When possible, digital photographs were taken of rare birds and of survey sites to supplement the MNFI digital library, and to aid in future categorization of grassland types.

Atlas Breeding Status

Breeding status was determined by survey block according to methods set forth in the MBBA II Project Handbook (KNC 2004). MBBA II survey blocks are based on quarter-townships and consist of nine legal sections (KNC 2004). While data were not collected along traditional Breeding Bird Survey (BBS) routes, we summarized this information by MBBA II block. Singing birds were treated as singing males for the purposes of assigning breeding criteria codes and we considered the species a probable breeder for that survey

Data Analysis

Data analysis will begin in the winter of 2006 when we (Julie Gibson and Helen Enander) will use a Geographic Information System (GIS) and statistical distribution modeling to investigate species distribution and landscape scale habitat associations using data from the first two years of surveys (2005, 2006). Our intention is to tease out associated landscape scale metrics such as moisture, slope, patch size, and landscape composition surrounding element occurrences of Henslows and Grasshopper sparrow, and Bobolink (*Dolichonyx oryzivorus*), and to potentially predict distribution in unsurveyed locations.

RESULTS and DISCUSSION

Study Area

The study sites for the second year of the grassland bird inventory (2006) included grasslands associated with the Upper and Lower Peninsulas of Michigan. Several sampling locations or points within 57 counties were visited on at least one occasion by MNFI staff and volunteers within federal, state, county, non-governmental organization conservation, and private parcels.

Point Counts

A total of 300 grassland bird surveys and 106 casual species observations were conducted within 57 counties and 191 Breeding Bird Atlas Blocks during the 2006 field season. MNFI staff and volunteers conducted 247 surveys and the Kalamazoo Nature Center (KNC) completed an additional 53 surveys.

Data from the KNC are also summarized in this report. This second year focused on state and federal public lands in the LP and in the EUP, in addition, several privately owned parcels enrolled in the Land Owner Incentive Program (LIP) were surveyed. A total of 284 point counts were conducted in the LP, and 16 in the UP.

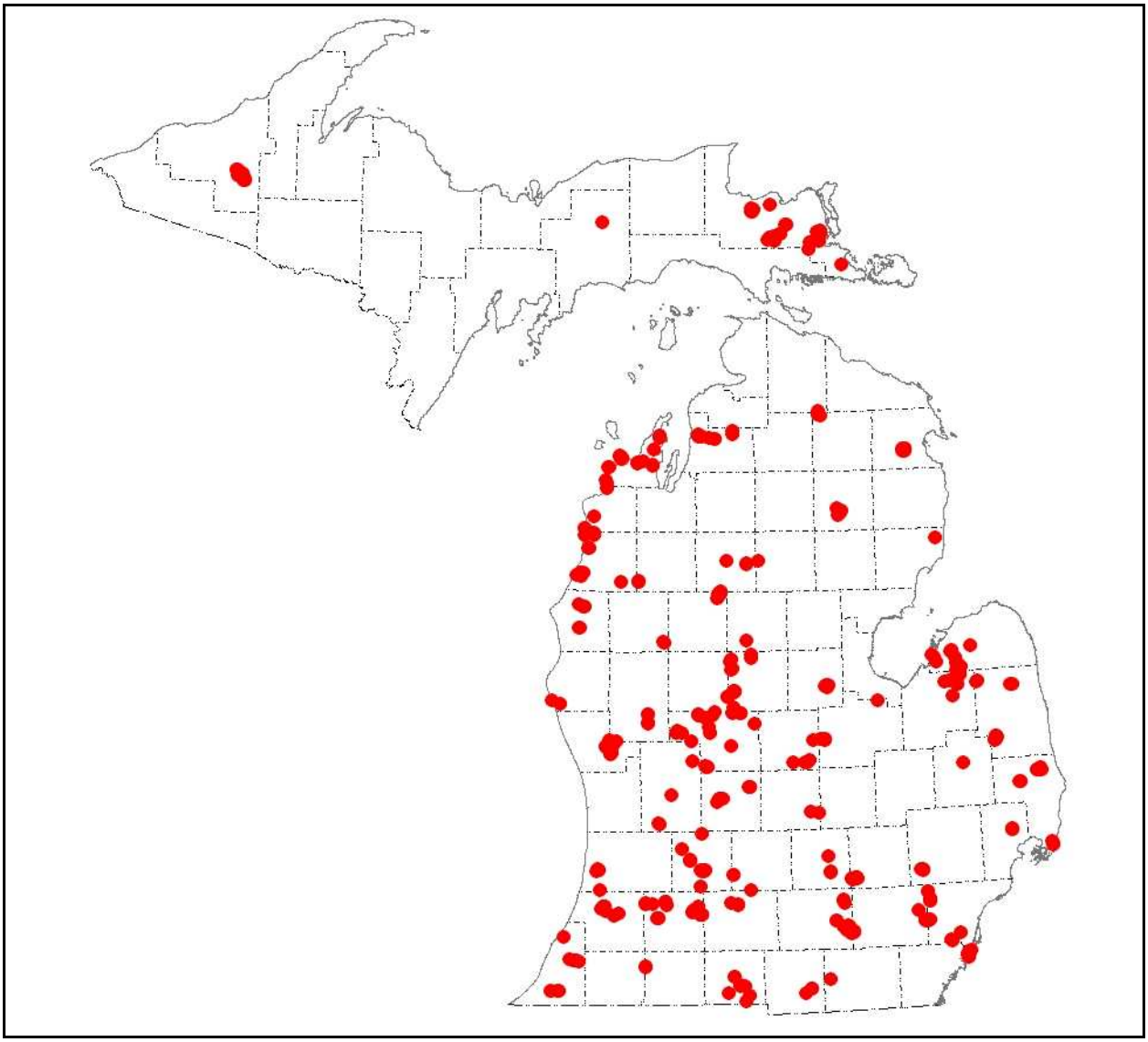

Figure 1. Locations of 300 grassland bird surveys and 106 casual species observations conducted in Michigan during the 2006 breeding season.

In addition, 106 incidental observations of Species of Greatest Conservation Need were noted in both the LP and the UP, bringing the total number of sites to 406 (Figure 1). Although standard point counts were not conducted at these 106 locations, habitat data were collected when possible. Pending permission on privately owned lands, standard point counts may be conducted at these sites during the 2007 field season.

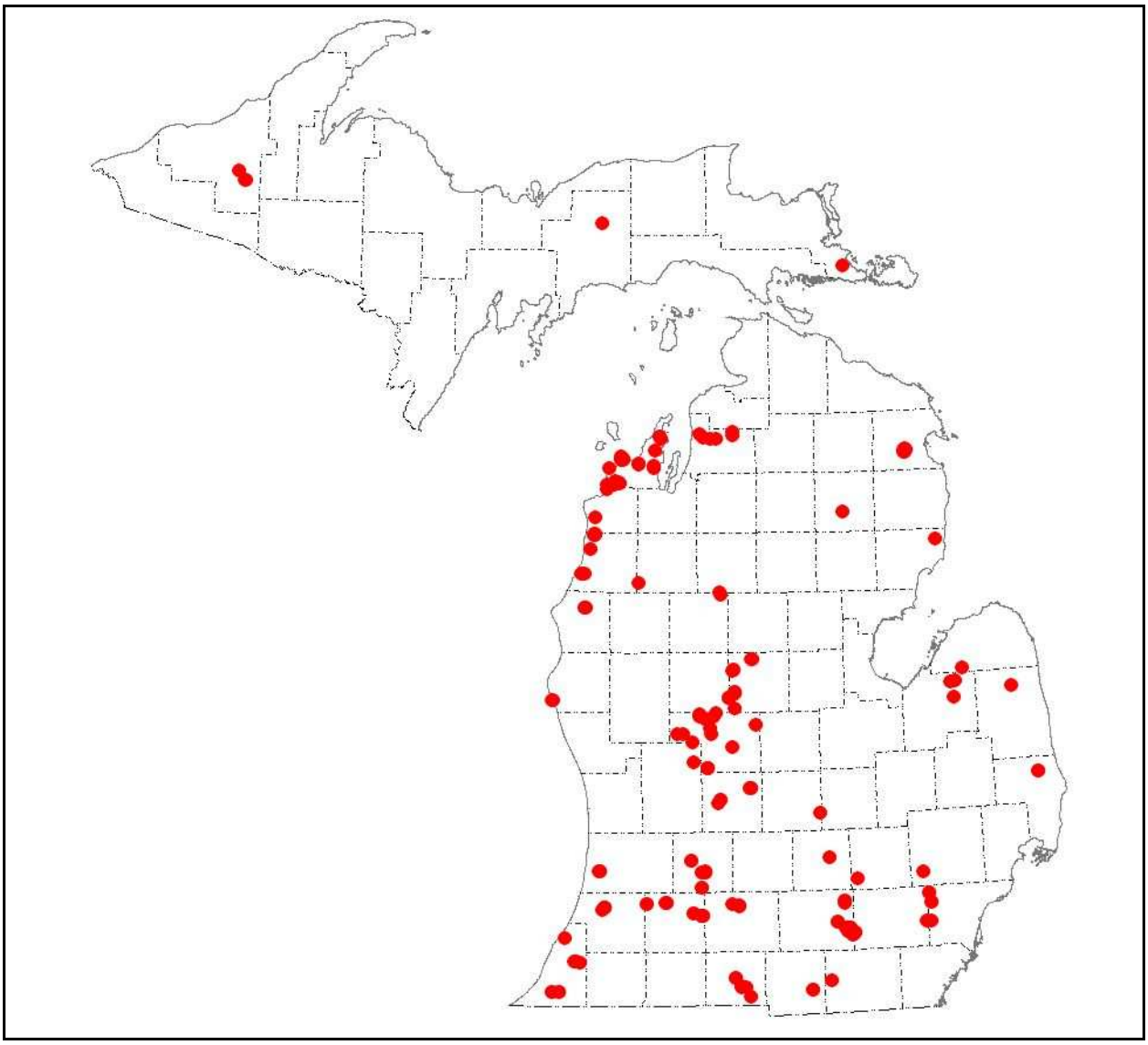

Figure 2. Locations of 115 state threatened or species of special concern grassland birds detected during the 2006 breeding season.

State listed grassland bird species, including Dickcissel, Henslow's Sparrow, Grasshopper Sparrow, Northern Harrier, Sharp-tailed Grouse, and Western Meadowlark were detected at 115 sites throughout Michigan, during the 2006 breeding season (Figure 2).

Among these 115 sites, 74 Dickcissel (state Species of Concern) were detected at 21 sites in 14 counties and 18 Breeding Bird Atlas Blocks (Figure 3). One hundred-fifteen Henslow's Sparrows (state threatened) were detected at 38 sites in 17 counties and 41 Breeding Bird Atlas Blocks (Figure 4). Two hundred-eight Grasshopper Sparrows (state Species of Concern) were detected at 67 sites in 32 counties and 69 Breeding Bird Atlas Blocks (Figure 5). Six Northern Harriers (state Species of Concern) were detected at five sites in five counties and five Breeding Bird Atlas Blocks (Figure 6). One site contained an adult Sharp-tailed Grouse (state Species of Concern) with 14 young (Figure 8), and finally, three Western Meadowlarks (state Species of Concern) were detected in three separate counties, in three Breeding Bird Atlas Blocks (Figure 7). Brief descriptions of each species habitat preferences accompany the 2006 detection maps, along with a listing of the public lands and associated counties where each state listed species was detected.

Henslow's Sparrow
Photo by Allen Chartier

Several targeted grassland associated species were not detected during 2006 surveys, including, species of greatest conservation need: American Bittern (*Botaurus lentiginosus)* (state species of concern), and two state endangered birds: Loggerhead Shrike (*Lanius ludovicianus*) and Short-eared Owl (*Asio flammeus*). It should be noted that one Short-eared Owl was observed by the author on May 10, 2006 in Chippewa County near the Munuscong Wildlife Management Area grasslands, but this was before surveys were initiated in late May. In addition, two Loggerhead Shrikes were observed in the LP by local birders, although those locations have not been passed onto the MNFI at this time.

Although a detailed analysis has not been conducted, anecdotally speaking, 2006 seemed to be a better-than-average year for many species of grassland birds. Sites that supported state listed species in 2005 often had an increase in individuals in 2006. For example, we reported two singing male Henslow's Sparrows at Waterloo State Game Area in 2005, and up to eight singing males in 2006. We also increased survey effort in some areas, including the Sharonville State Game Area. This proved to be a very important area for Henslow's Sparrow. We detected more singing males here than at any other area in Michigan, with 25 detected during the 2006 breeding season. The next highest number of Henslow's Sparrows detected during surveys at any one site is seven singing males. This state game area should therefore be nominated as a potential Important Bird Area. In addition, another elusive sparrow, LeContes Sparrow (*Ammodramus leconteii)*, was detected and banded in record numbers in Chippewa Co. by Brian Johnson and Lena Usyk this year. The following maps show where each state listed species was detected during the 2006 breeding season.

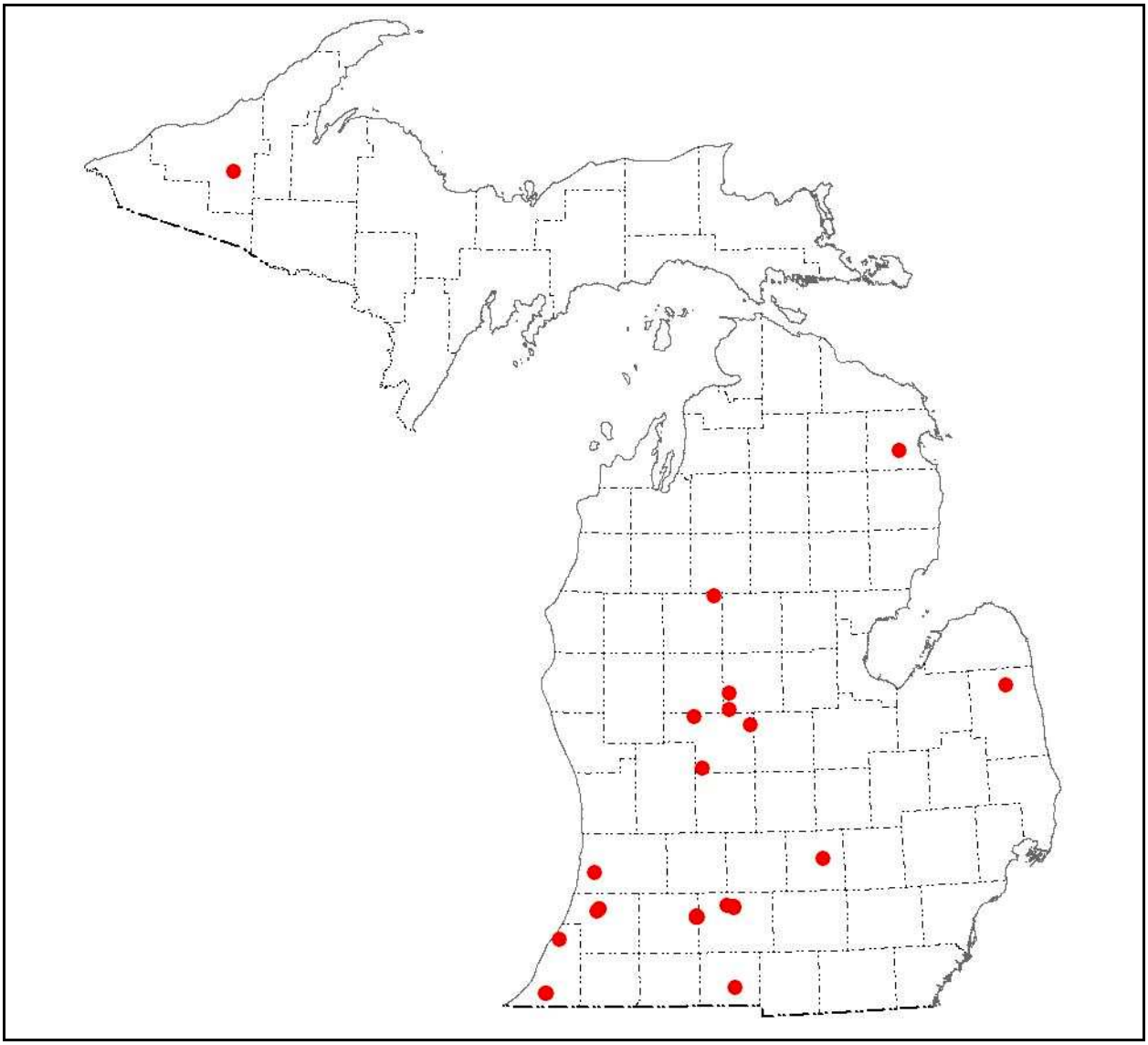

Figure 3. Dickcissel detections during the Michigan 2006 Breeding Season.

Dickcissel reportedly breed in tall grass prairie, old fields, and planted prairies containing intermediate to high vegetation density, a medium to thick litter layer, and the presence of scattered perches.

Detections of Dickcissel on public lands in 2006 occurred at Allegan State Game Area in Allegan Co, Minden State Game Area in Sanilac Co., and at the Prairie Chicken Management Area in Osceola Co.

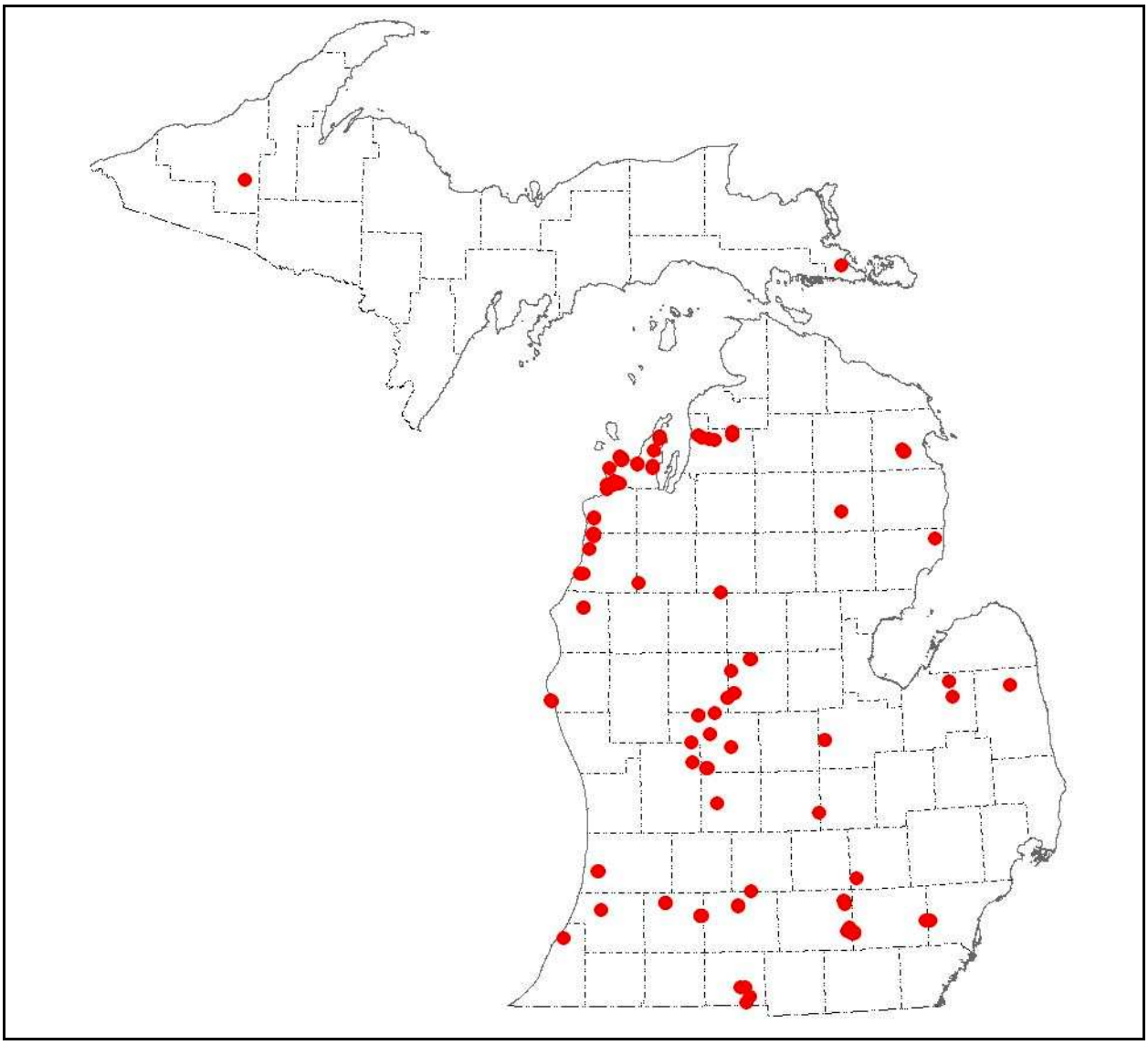

Figure 4. Grasshopper Sparrow detections during the Michigan 2006 Breeding Season.

Grasshopper Sparrow breeding habitat may include old fields, hay fields, native prairie, recent burns, and capped landfills with patchy, bare ground. Vegetation density is low to intermediate with none to thin litter layer. Detections of Grasshopper Sparrow on public lands in 2006 occurred at Allegan State Game Area in Allegan Co, DeFord State Game Area in Tuscola Co., Gregory State Game Area in Livingston Co., Minden State Game Area in Sanilac Co., Sharonville State Game Area in Jackson Co. and Washtenaw Co., the Prairie Chicken Management Area in Osceola Co., and Sleeping Bear Dunes in Leelanau and Benzie counties.

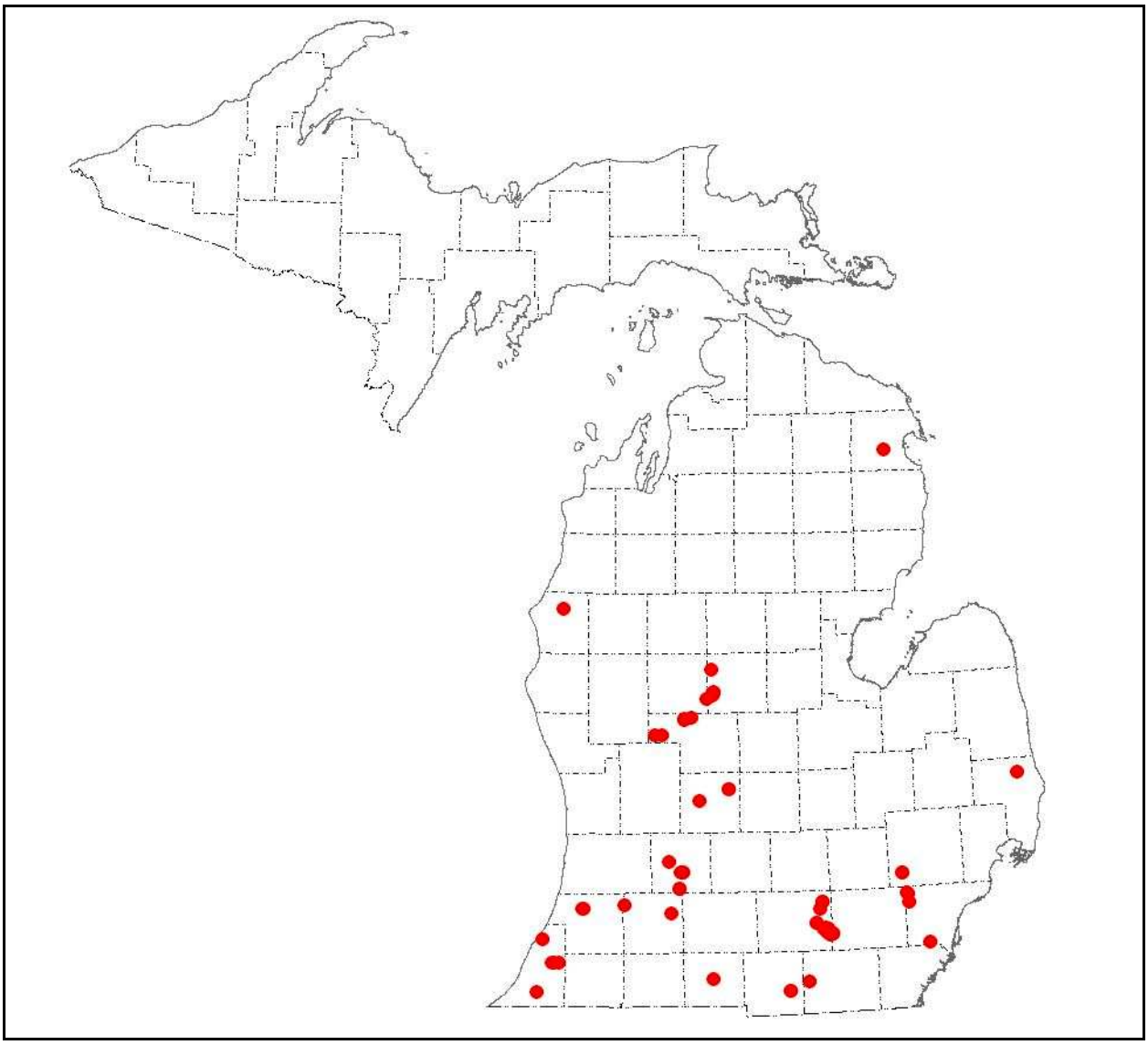

Figure 5. Henslow's Sparrow detections during the Michigan 2006 Breeding Season.

Although many gaps in knowledge exist regarding Henslow's Sparrow, reported nesting habitat includes wet meadows and rank grasses, hayfields, old fields, wildlife plantings of smooth brome (*Bromus inermis*) and switch grass (*Panicum virgatum)*, and tall grass prairie. Most reports generally agree this species prefers intermediate to high vegetation density, a moderate to thick litter layer, and little to no woody vegetation. Detections of Henslow's Sparrow on public lands in 2006 occurred at Gregory State Game Area in Livingston Co., Ionia State Rec. Area in Ionia Co., Port Huron State Game Area in St. Clair Co., Sharonville State Game Area in Jackson and Washtenaw counties, and Waterloo State Game Area in Jackson Co.

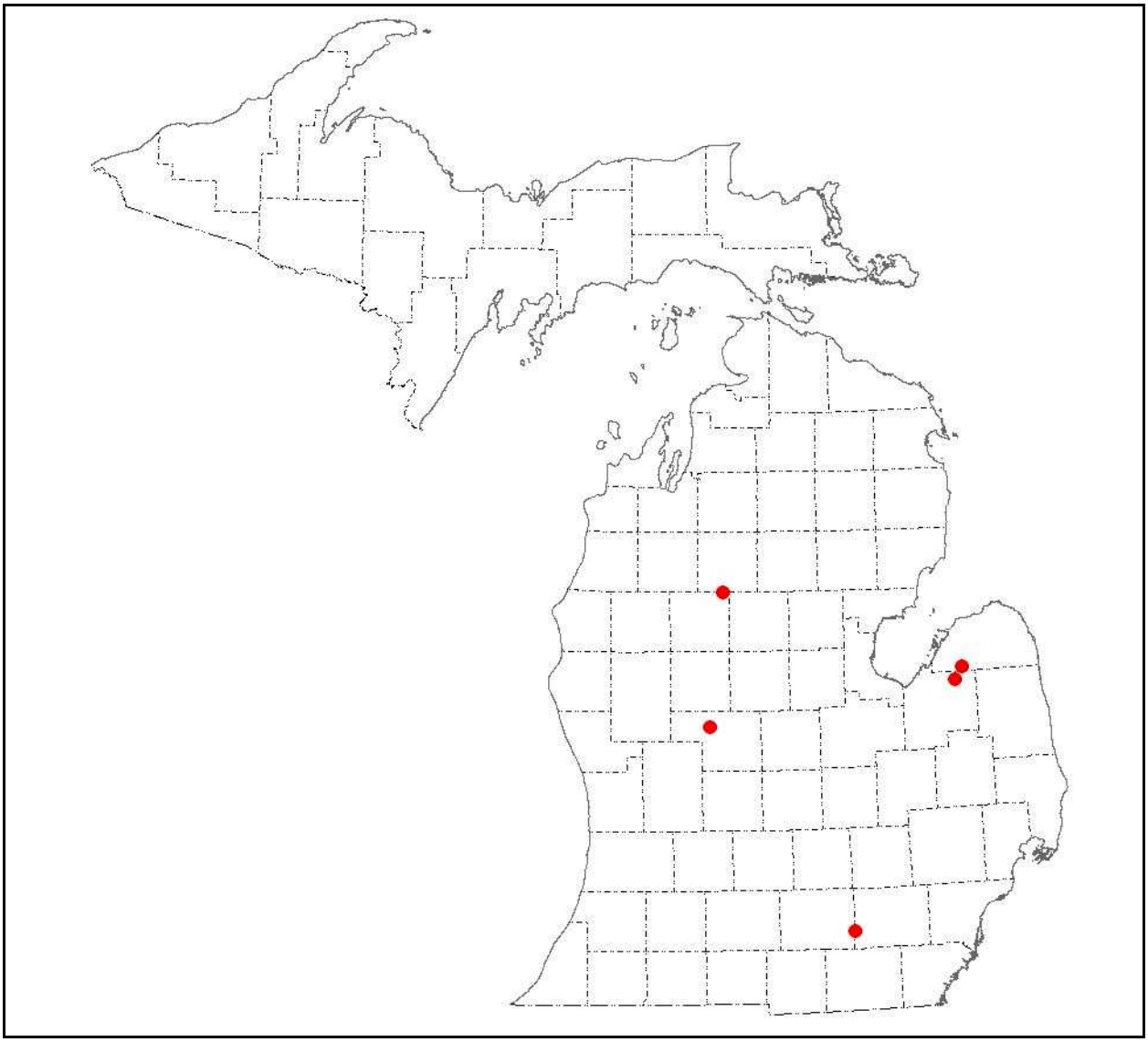

Figure 6. Northern Harrier detections during the Michigan 2006 Breeding Season.

Northern Harrier nesting habitat includes wet meadows and rank grasses, marshes, and prairies. Vegetation density is reportedly intermediate to high, with a medium litter layer depth. Detections of Northern Harrier on public lands in 2006 occurred at Gagetown State Game Area in Huron Co., Winchester State Game Area in Tuscola Co., the Prairie Chicken Management Area in Osceola Co, and at Sharonville State Game Area in Washtenaw Co.

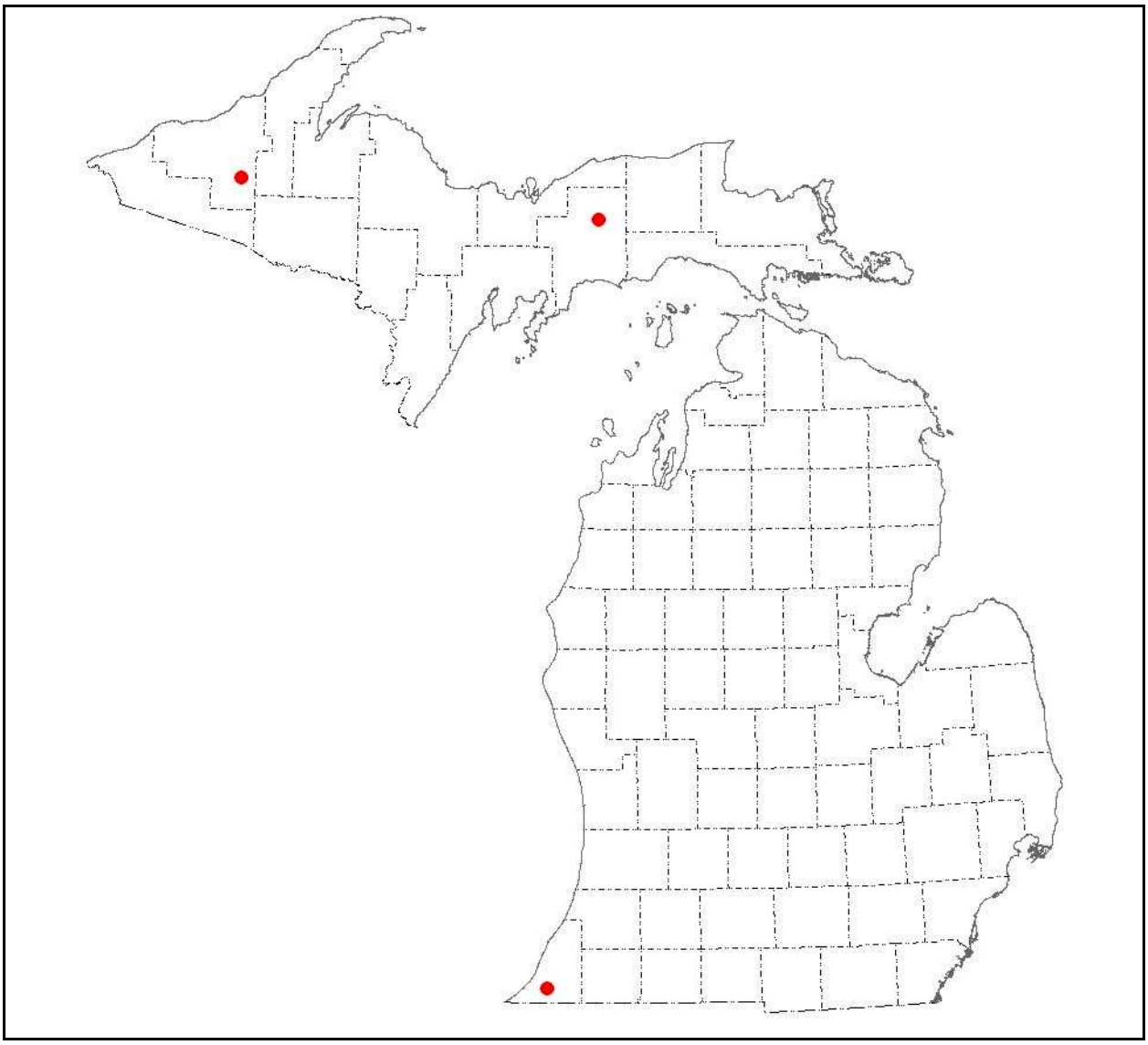

Figure 7. Western Meadowlark detections during the Michigan 2006 Breeding Season.

Sample (1989 *in Swanson 1996*) noted that Western Meadowlarks preferred larger, drier, more upland sites than Eastern Meadowlarks. Anecdotally, they generally seem to be found in more weedy sites in Michigan, as well.

Detection of Western Meadowlark on public lands in 2006 occurred in the Upper Peninsula at Seney National Wildlife Refuge at the Diverson Farm survey site.

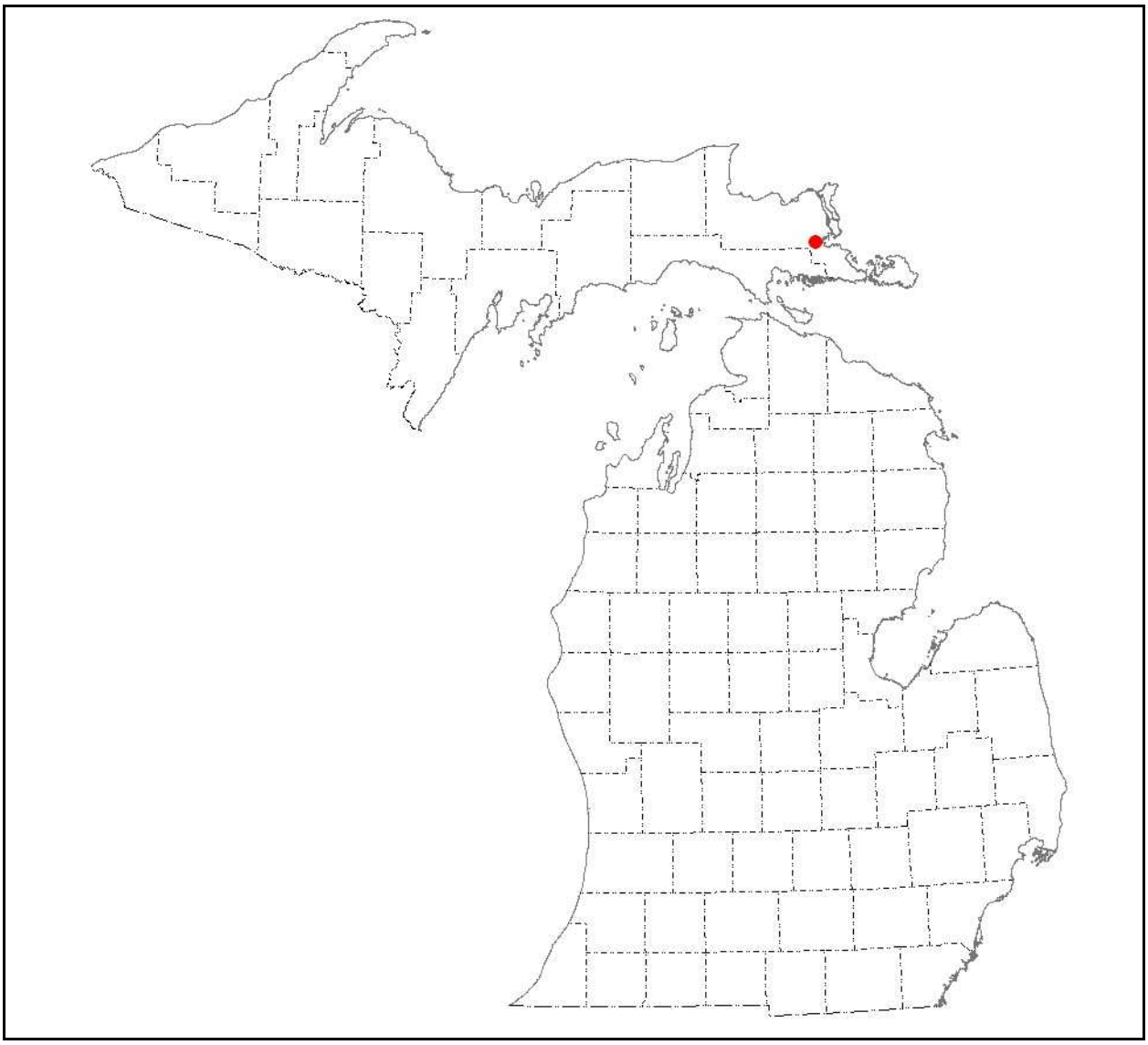

Figure 8. Sharp-tailed Grouse detection during the Michigan 2006 Breeding Season.

Sharp-tailed Grouse prefer undisturbed, large grasslands with an intermediate vegetation density, a medium litter layer depth, and little woody vegetation. Threats on breeding grounds include habitat loss and fragmentation, fire suppression, and succession. Periodic burning is preferred over mowing when managing for this declining species. One detection of Sharp-tailed Grouse (one adult with 14 young) was made in 2006 at the Munuscong Wildlife Management Area in Chippewa Co.

ACKNOWLEDGEMENTS

This project is being funded by the Michigan Department of Natural Resources Wildlife Division. Michigan DNR staff contributed significantly to the project by providing valuable on-the-ground insight about many state and private owned grasslands. Special thanks to Helen Enander who provided GIS support, and to Ray Adams and the Kalamazoo Nature Center research staff who assisted with bird surveys. Many thanks to our volunteers who conducted surveys this year, including Allen Chartier, Erik Enbody, Brian Johnson, Jerry Jourdan, David Pavlik, and Keith Saylor. Finally, Dave Slager, Ryan Dziedzic, and other local Michigan birders provided important details for several site leads and state listed species observations.

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