Woodland Owl Surveys in Support of the Michigan Breeding Bird Atlas II: Year 2

Prepared By:
Michael J. Monfils
Michigan Natural Features Inventory
P.O. Box 30444
Lansing, MI 48909-7944

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EXECUTIVE SUMMARY

The first Michigan Breeding Bird Atlas project occurred during 1983 – 1988 and had a goal of mapping the distribution of bird species that breed in Michigan (McPeek and Adams 1991). The Michigan Breeding Bird Atlas II (MBBA II) project was started in 2001 to help identify changes in bird populations and distributions. McPeek and Adams (1991) noted that early nesting and nocturnal species were underreported in the first Atlas. Because woodland owls are largely nocturnal, often utilize remote habitats, and breed in the late winter or early spring, they are typically underrepresented in large-scale breeding bird surveys. Consequently, information is lacking on the distribution, abundance, breeding phenology, and habitat use of woodland owls.

In 2003 the Michigan Natural Features Inventory proposed a three-year statewide survey of forest-nesting owls to increase the data available for the MBBA II. Nineteen (19) randomly selected North American Breeding Bird Survey (BBS) routes were surveyed in 2005 during four periods: 1) mid January – mid February; 2) mid February – mid March; 3) mid March – mid April; and 4) mid April – mid May. In the southern Lower Peninsula (SLP), we conducted surveys during all four periods, while in the northern Lower Peninsula (NLP) and Upper Peninsula (UP) surveys were done in the second, third, and fourth periods. We situated point-count stations at approximately 1.6-km (1.0-mile) intervals along each route. Surveys occurred between 0.5 hr after sunset and 0.5 hr before sunrise. We avoided conducting surveys during heavy precipitation or high winds. At each point the time, temperature, moon visibility, cloud cover, precipitation level and type, wind speed, snow cover, and noise level was recorded. Each point count consisted of a two-min silent period, followed by a two-min broadcast period for each species, and ended with final two-min silent period. We broadcasted owl calls using an electronic game caller. At Lower Peninsula stations, calls of Northern Saw-whet Owl, Eastern Screech-Owl, Long-eared Owl, Barred Owl, and Great Horned Owl were played. Calls of Boreal Owl were played in place of Northern Saw-whet Owl and Great Gray Owl was added to the broadcast series for UP stations. The period of first response and estimated location was noted for each owl observation. We summarized the data recorded at survey stations by quarter-township (nine mi^2) MBBA II survey block.

We documented 634 owl observations in 2005, consisting of 40 Northern Saw-whet Owls, 245 Eastern Screech-Owls, four Long-eared Owls, 111 Great Horned Owls, and 234 Barred Owls, compared to 456 owls in 2004. In the southern Lower Peninsula (SLP), we recorded nearly three times as many Eastern Screech-Owls as Great Horned Owls. The highest observation rates (birds/station) for both species occurred during the first and second period in the SLP. While Great Horned Owl was regularly observed throughout the State, we recorded more in the SLP than the northern Lower Peninsula (NLP) and UP combined. In the NLP we observed Great Horned Owl at a slightly higher rate during the third period. Great Horned Owl was recorded at similar rate in the second and fourth periods in the UP, but was not observed during the third period. Barred Owl was the most common species in both the NLP and UP. We recorded Barred Owl most often during the fourth period in the SLP and NLP, while observation rates were similar during the third and fourth periods in the UP. While Northern Saw-whet Owl observations were sporadic, we documented similar numbers in each zone of the State. Observation rates for Northern Saw-whet Owl were low, and the species was not recorded during the fourth survey in the SLP or the second survey in the UP. Except for an additional incidental observation in the SLP, the other four Long-eared Owl records occurred in the UP. We assigned breeding status for owls in 265 MBBA II survey blocks in 2005, with Northern Saw-whet Owl, Eastern Screech-Owl, Great Horned Owl, and Barred Owl making up 12, 26, 27, and 34% of the blocks, respectively. The proportion of the total observations represented by the five

owl species in 2005 was similar to what we documented on 204 blocks in 2004.

Our preliminary comparisons of the number of responses observed during equal length time periods occurring before and after broadcasts indicated that response to calls varied by species and survey. We recorded significantly more Eastern Screech-Owls after broadcasts during each survey. When we compared four-minute blocks before and after broadcast for Barred Owl, we had significantly more responses before broadcast during the fourth survey. There were no other significant differences for any other Barred Owl comparisons. Similar to Barred Owl, we observed more responses of Great Horned Owls prior to broadcast during the fourth survey period. No significant differences in responses were observed for Great Horned Owl in any of our other comparisons. We found no differences in the number of Northern Saw-whet Owl responses before and after broadcast. Because we played broadcasts of all forest-nesting owls, it is unknown what affect this may have had on the responsiveness of these species. Specific research is needed to understand the effectiveness of broadcast calls in surveying for these and other owl species.

Preliminary Chi-square analyses indicated that owl presence might be related to several environmental factors; however, the results were often inconsistent both within and among species. In some cases Chi-square analyses were of limited use due to the low number of points that fell within some of the environmental categories. Eastern Screech-Owl, Great Horned Owl, and Barred Owl presence appeared to be associated with noise level in that owls were observed at fewer points than expected when the noise level was at 3 or 4, which is consistent with field observations. We documented Eastern Screech-Owls and Great Horned Owls at fewer points than expected in late evening during some survey periods. This finding may also be related to noise level, since we typically had more automobile traffic during this period, which was a common source of noise. More data and analyses are needed before conclusions can be made about the potential associations of these and other environmental variables with owl presence. We feel likelihood-based detectability modeling could be used to elucidate if environmental factors affect the detectability of owls.

The data collected in this project could allow for future analysis of the potential affect of environmental variables and landscape on woodland owl detectability and site occupancy. Additional analyses of landscape-level habitat selection by forest-nesting owls may also be possible. We believe additional owl surveys are needed to increase coverage of the State for Atlas purposes, refine survey protocols, and further our understanding of owl breeding phenology and landscape habitat use. Given the few Long-eared Owls that have been documented thus far in the project, it appears that targeted surveys may be needed for this and other rare owl species. We feel future studies should investigate if broadcast call techniques are effective for all owl species, what the optimal spacing of survey stations is for target species, the effective distance covered by broadcast calls, and the affect of environmental variables on detectability. Research is also needed to improve our understanding of woodland owl habitat use, nest site selection, productivity, and the effects of forest fragmentation and management on breeding owls.

INTRODUCTION

The original Michigan Breeding Bird Atlas (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. McPeek and Adams (1991) acknowledged that species that nest early in the season and are nocturnal were underreported in the first Atlas due to concentration of field work between late May and early July and in early morning hours. Because woodland owls are largely nocturnal, often utilize remote and inaccessible habitats, and breed in the late winter or early spring, they are typically underrepresented in most large-scale breeding bird surveys, such as state atlas projects and the North American Breeding Bird Survey (BBS). Subsequently, information is lacking on the distribution, abundance, breeding phenology, and habitat use of woodland owls. Scientists recognize the need to develop and use standardized protocols to monitor owl populations (Morrell et al. 1991, Takats et al. 2001).

In 2003 the Michigan Natural Features Inventory (MNFI) proposed to conduct systematic surveys for forest-nesting owls to provide improved data for the MBBA II. We expected that a three-year effort would be required to adequately survey the state for these species. Our objectives were to 1) provide improved data for the MBBA II project, 2) expand our knowledge of the distribution, abundance, breeding status, and phenology of forest-nesting owls in Michigan, 3) collect baseline data using an accepted protocol that would allow for long-term monitoring of trends, 4) evaluate the effectiveness of broadcast call surveys in locating breeding owls, and 5) gather information on the habitat use of forest-nesting owl species at the landscape level.

METHODS

Point Counts

Woodland owl surveys were conducted in 2005 along 19 randomly selected BBS transects (Figure 1). MNFI staff conducted surveys on 15 of these routes and the Kalamazoo Nature Center (KNC) surveyed an additional four transects. Data from the KNC transects are also summarized in this report. Eight of the total routes surveyed were also surveyed in 2004. Nine routes were surveyed in the southern Lower Peninsula (SLP), five in the northern Lower Peninsula (NLP), and five in the Upper Peninsula (UP) (Figure 1). In 2004 transects were surveyed once during each of three periods, mid January to mid February, mid February to mid March, and mid March to mid April, for a total of three surveys. For 2005 a fourth survey period from mid April to mid May was added in an effort to increase detections of later nesting owl species. The first survey period was discontinued for NLP and UP routes in 2005, due to the low number of owl responses observed in 2004. The 2005 survey protocol resulted in a total of four surveys being conducted in the SLP and three surveys in the NLP and UP. Surveys were staggered so that SLP transects were done first, NLP second, and UP third, and starting dates were separated by approximately one week in each zone.

The owl survey methodology used in this project was based on the Guidelines for Nocturnal Owl Monitoring in North America (Takats et al. 2001). We located owl point-count stations at 1.6 km (1.0 mile) intervals along each transect. Since each BBS route has 50 point-count stations situated at approximately 0.8 km (0.5 mile) intervals, we generally surveyed every other station. Because woodland owls were the focus of this survey, stations that had no forest blocks within 0.8 km (0.5 mile) were

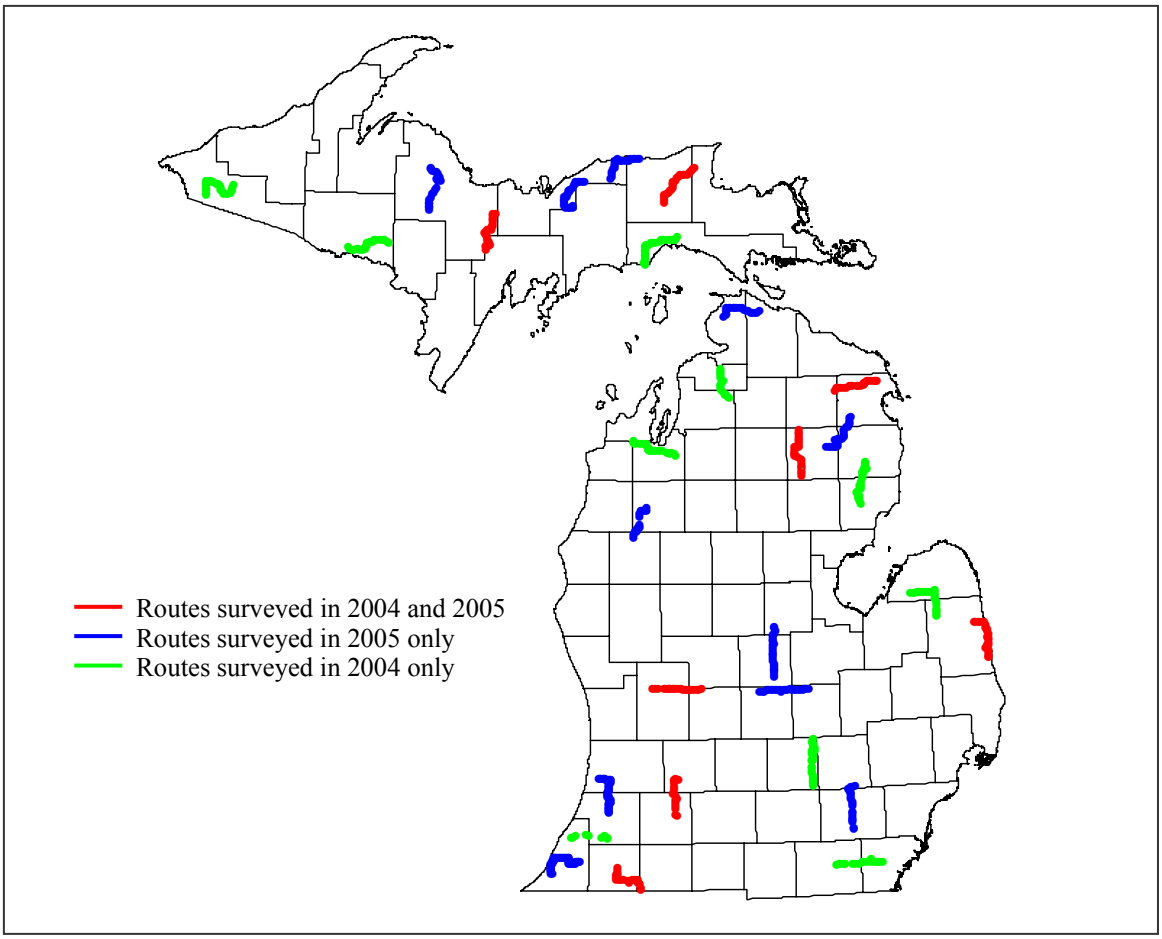

Figure 1. Locations of woodland owl survey routes conducted in Michigan in 2004 and 2005.

excluded from the survey. When turns in the predefined routes placed a survey station closer than 1.6 km from the previous, we skipped that point and moved to the next station that was at least 1.6 km away. Each station was situated within approximately 0.4 km (0.25 mile) in any direction of the predefined point, which provided flexibility in finding locations that were safe and allowed the survey to be conducted without disturbing landowners. If a suitable station could not be located within 0.4 km of the original point, that station was skipped and observers moved on to the next point.

We conducted surveys between 0.5 hr after sunset and 0.5 hr before sunrise and varied starting times as much as practicable. We made an effort to survey each route during each of three portions of the night: first third dusk to late evening), second third (late evening to early morning), and last third (early morning to dawn). Heavy precipitation and winds greater than or equal to 20 km/hr (13 mph, equivalent to Beaufort Scale 4) were avoided; however, if conditions deteriorated during the course of a survey, we completed the survey in an effort to evaluate the methodology in a variety of weather conditions. We noted the time of survey and collected data on temperature, moon visibility, cloud cover, precipitation level and type, wind speed, snow cover, and noise level at each station.

The point counts consisted of a two-minute silent period, followed by a two-minute broadcast period for each species, and ended with final two-minute silent period. We broadcasted owl calls recorded on a CD

using a Dennis Kirk/Anchor PB-25 electronic game caller. Calls were played as loud as possible without distortion, which typically ranged from approximately 80-95 dB. A broadcast period for a species consisted of 20 s of calls followed by 20 s of silence, which was repeated three times for a total of two minutes. At Lower Peninsula stations calls of Northern Saw-whet Owl (*Aegolius acadicus*), Eastern Screech-Owl (*Megascops asio*), Long-eared Owl (*Asio otus*), Barred Owl (*Strix varia*), and Great Horned Owl (*Bubo virginianus*) were played for a total survey period of 14 minutes. Calls of Boreal Owl (*Aegolius funereus*), Eastern Screech-Owl, Long-eared Owl, Barred Owl, Great Gray Owl (*Strix nebulosa*), and Great Horned Owl were broadcast at UP stations and the survey period totaled 16 minutes. Calls were played in order from smallest owl to largest. For each series of three calls, we rotated the caller 120° to ensure full coverage. We considered that an owl had responded to a broadcast when it vocalized or flew toward the survey station. For each owl response we recorded the species, sex (if discernable), survey period during which the response was first observed, and estimated location. Locations of owls were approximated by estimating the distance away from the observer and taking a compass bearing from the station point. Due to the difficulty of estimating distances of vocalizing owls at night, we recorded distance using six categories: 1) ≤ 100 m; 2) > 100 m and ≤ 250 m; 3) > 250 m and ≤ 500 m; 4) > 500 m and ≤ 750 m; 5) > 750 m and ≤ 1000 m; and 6) > 1000 m.

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 was collected from stations spaced at 1.6-km intervals along BBS routes, we summarized this information by MBBA II block. Owls vocalizing in response to broadcast calls were treated as singing males for the purposes of assigning breeding criteria codes. The "S" breeding code is assigned when a singing male is present at the same location on at least two dates at least seven days apart (KNC 2004). We used sections as boundaries in determining if observations were repeat occurrences, i.e. if we recorded an owl of the same species in the same section during two or more surveys separated by at least one week, we assigned the observation breeding code S and considered the species a probable breeder for that survey block.

Data Analysis

Because we noted instances in the field when apparently individual owls were recorded at more than one survey station, we estimated the number of repeat detections that occurred for each species. We made two assumptions in estimating repeat detections: 1) owl calls of the same species coming from the same approximate location (based field observations, compass bearings, and distance estimates) on two or more consecutive stations were made by the same owl (i.e. repeat detection), and 2) owl responses of the same species observed at different locations on two consecutive stations were from different birds.

We used the Sign Test to determine if the number of owl observations recorded before and after conspecific broadcast was significantly different than what would be expected. Since we only considered the presence or absence of a species before and after broadcast, the binomial distribution was assumed. The Sign Test is a nonparametric paired-sample test developed from the concept of the binomial test, and is essentially a binomial test with p hypothesized to be 0.50 (Zar 1996). We only used data from stations where owls were present for this analysis, and examined the number of times an owl was observed before (+) or after (-) conspecific calls were played. Testing was conducted by survey

period, since owl responsiveness may vary due to breeding phenology, and we only compared equal numbers of two-minute survey blocks (e.g. first silent period vs. Eastern Screech-Owl broadcast period).

To evaluate the potential relationship of woodland owl detectability (presence/absence) and various environmental factors, we conducted Chi-square analyses on contingency tables. We used this analysis to test if the frequency of points with owls present and absent was independent of the frequency of points falling within 3 – 5 categories for each environmental variable. The following environmental variables were used in these analyses: time of night, temperature, wind speed, cloud cover, moon visibility, and noise level. For the time of night variable, each point was assigned to one of three categories (late evening, middle of the night, and early morning). Each category represented one-third of the dark hours, based on the beginning and ending of civil twilight. For the temperature and wind speed variables, points were assigned to one of five categories spanning the range of values recorded in each survey period. At each point cloud cover was assigned to one of five categories: 1) ≤ 20% cloud cover; 2) > 20% to ≤ 40% cloud cover; 3) > 40% to ≤ 60% cloud cover; 4) > 60% to ≤ 80% cloud cover; and 5) > 80% cloud cover. Noise level was ranked at each point in one of four categories: 1) completely silent, 2) some noise but not enough to impact to the survey, 3) significant noise that may have reduced owl detectability, and 4) continuous noise that definitely impacted owl detectability. All but four of the 245 Eastern Screech-Owl records occurred in the SLP, so our analyses for this species only used data from that region. Since Great Horned Owl and Barred Owl were observed throughout the State, we used data from all three zones when conducting analyses. Relatively few Northern Saw-whet Owls and Long-eared Owls were recorded, so we did not conduct Chi-square analyses for these species.

RESULTS

Atlas Breeding Status

A total of 634 owl observations, consisting of 40 Northern Saw-whet Owls, 245 Eastern Screech-Owls, four Long-eared Owls, 111 Great Horned Owls, and 234 Barred Owls, was recorded during surveys conducted at 1,293 points along 19 BBS routes in 2005 (Table 1). A fifth Long-eared Owl was observed incidentally in the SLP while traveling from a survey route. In 2004 we had 456 owl observations, which consisted of 35 Northern Saw-whet Owls, 157 Eastern Screech-Owls, five Long-eared Owls, 116 Great Horned Owls, and 143 Barred Owls. The higher total in 2005 is due to the addition of a fourth survey period and another route. While numbers of Eastern Screech-Owl and Barred Owl increased substantially in 2005, those of Northern Saw-whet Owl, Long-eared Owl, and Great Horned Owl did not.

In the SLP more than three times as many Eastern Screech-Owls were observed than Great Horned Owls in 2005. Observation rates (total birds recorded/total stations surveyed) for both Eastern Screech-Owl and Great Horned Owl were highest during the first two survey periods (Table 1). Although Great Horned Owl was regularly observed throughout the State, we recorded more in the SLP than the NLP and UP combined. Great Horned Owl was observed at a slightly higher rate during the third period in the NLP. In the UP Great Horned Owl was not recorded during the third period and was observed at similar rates during the second and fourth periods. We observed more Barred Owls than any other species in both the NLP and UP. Most Barred Owl observations in the SLP occurred on routes in the western portion of the zone. In the SLP and NLP Barred Owl was recorded at the highest rate in the fourth period, while observation rates were similar during the third and fourth periods in the UP. Similar numbers of Northern Saw-whet Owls were recorded in each of the three zones (Table

Table 1. Summary of owl observations by region and survey period recorded during surveys conducted in Michigan in 2005.

Region[a]	Survey Period	No. Points	No. Saw-whet Owl[b]		East. Screech-Owl[c]		Long-eared Owl		Great Horned Owl		Barred Owl		Total	
			No. Obs.[d]	Mean[e]	No. Obs.	Mean	No. Obs.	Mean	No. Obs.	Mean	No. Obs.	Mean	No. Obs.	Mean
SLP	1	169	1	0.01	77	0.46	0	0.00	29	0.17	3	0.02	110	0.65
	2	167	10	0.06	76	0.46	0	0.00	20	0.12	10	0.06	116	0.69
	3	167	2	0.01	46	0.28	0	0.00	14	0.08	17	0.10	79	0.47
	4	162	0	0.00	42	0.26	0	0.00	5	0.03	27	0.17	74	0.46
	Subtotal	665	13	0.02	241	0.36	0	0.00	68	0.10	57	0.09	379	0.57
NLP	1	---	---	---	---	---	---	---	---	---	---	---	---	---
	2	105	3	0.03	0	0.00	0	0.00	8	0.08	24	0.23	35	0.33
	3	104	8	0.08	3	0.03	0	0.00	13	0.13	29	0.28	53	0.51
	4	102	3	0.03	1	0.01	0	0.00	7	0.07	51	0.50	62	0.61
	Subtotal	311	14	0.05	4	0.01	0	0.00	28	0.09	104	0.33	150	0.48
UP	1	---	---	---	---	---	---	---	---	---	---	---	---	---
	2	106	0	0.00	0	0.00	0	0.00	7	0.07	7	0.07	14	0.13
	3	105	6	0.06	0	0.00	3	0.03	0	0.00	30	0.29	39	0.37
	4	106	7	0.07	0	0.00	1	0.01	8	0.08	36	0.34	52	0.49
	Subtotal	317	13	0.04	0	0.00	4	0.01	15	0.05	73	0.23	105	0.33
Overall	1	169	1	0.01	77	0.46	0	0.00	29	0.17	3	0.02	110	0.65
	2	378	13	0.03	76	0.20	0	0.00	35	0.09	41	0.11	165	0.44
	3	376	16	0.04	49	0.13	3	0.01	27	0.07	76	0.20	171	0.45
	4	370	10	0.03	43	0.12	1	0.00	20	0.05	114	0.31	188	0.51
	Total	1293	40	0.03	245	0.19	4	0.00	111	0.09	234	0.18	634	0.49

[a] SLP = Southern Lower Peninsula, NLP = Northern Lower Peninsula, and UP = Upper Peninsula.
[b] Northern Saw-Whet Owl.
[c] Eastern Screech-Owl.
[d] Number of owls observed.
[e] Average number of owls per point surveyed.

1). Northern Saw-whet Owl observation rates were highest in the second and third periods for the SLP and NLP, respectively, while observation rates were equally as high during the third and fourth periods in the UP. Three of four Long-eared Owl records in the UP occurred during the third period.

We determined breeding status for five owl species on 265 MBBA II survey blocks in 2005 (Table 2), compared to 204 blocks in 2004. Northern Saw-whet Owl, Eastern Screech-Owl, Great Horned Owl, and Barred Owl made up 12, 26, 27, and 34% of the blocks, respectively. The number of survey blocks with observations increased for all species in 2005, but the proportion of the total represented by each species was very similar to 2004.

In 2005 Northern Saw-whet Owl was recorded sporadically throughout the State and was observed on a similar number of survey blocks in each of the three zones (Figure 2). Eastern Screech-Owl was observed on the greatest number of blocks in the SLP (Figure 3). We only recorded Long-eared Owl as a possible breeder on one SLP and three UP survey blocks (Figure 4). Great Horned Owl was the second most common species in the SLP, and was recorded in the second highest number of blocks overall (Figure 5). Barred Owl was observed on the greatest number of survey blocks and was most common in the NLP and UP (Figure 6). Table A-1 (Appendix A) lists the owl breeding data by survey block.

Because the third and fourth survey periods occurred during the early spring, we observed breeding activity of several incidental species. Twenty-one (21) other bird species were recorded during owl surveys (Table 3). Canada Goose (*Branta canadensis*) and American Woodcock (*Scolopax minor*) were the most commonly observed incidental species, being recorded on 17 and 14 survey blocks, respectively. We recorded White-throated Sparrow (*Zonotrichia albicollis*) on eight and Killdeer (*Charadrius vociferus*) on seven survey blocks. The remaining 17 species were only observed on three or less survey blocks (Table 3). Incidental species data are summarized by survey block in Table A-2 (Appendix A).

Survey Efficacy

We noted repeat detections for Eastern Screech-owl, Great Horned Owl, and Barred Owl at estimated overall rates of <0.1, 6.7, and 6.4% of the total observations, respectively. While no Great Horned Owl repeat detections were noted in the NLP, they were estimated to occur in 5.6% of SLP and 12.1% of UP observations. We estimated that 8.0% of the NLP and 8.9% of the UP Barred Owl records were observed at more than one survey point. No repeat Barred Owl observations were noted in the SLP.

Our preliminary testing of equal length survey blocks before and after broadcasts indicated that response to calls varied by species and survey period. The number of Northern Saw-whet Owls observed before and after broadcast was not significantly different for any survey; however, observation rates for this species were low. We consistently observed Eastern Screech-Owls more often after conspecific calls were broadcast than before during each survey period ($p \leq 0.019$). The result was the same whether we compared two-min (first silent vs. Eastern Screech-Owl period) or four-min (first silent + Northern Saw-whet periods vs. Eastern Screech-Owl + Long-eared Owl periods) blocks of the survey. Similar results were observed for Eastern Screech-Owl in 2004. There were no significant differences when we compared the number of Barred Owl responses between the first silent and Barred Owl broadcast periods. In comparing the number of Barred Owl responses between four-min blocks (first silent + Northern Saw-whet or Boreal Owl periods vs. Barred Owl + Great Gray or Great Horned Owl periods), we observed more responses prior to broadcast than after during the fourth survey period ($p=0.013$).

Table 2. Number of blocks with owl observations by region and breeding status (according to MBBA II criteria) from surveys conducted in Michigan in 2005.

	SLP[a]			NLP		UP		
Species	**PO[b]**	**PR**	**CO**	**PO**	**PR**	**PO**	**PR**	**Total**
Northern Saw-whet Owl	12	---	---	8	1	11	---	32
Eastern Screech-Owl	27	37	---	4	---	---	---	68
Long-eared Owl	1	---	---	---	---	3	---	4
Great Horned Owl	36	6	---	17	3	7	2	71
Barred Owl	6	11	1	24	15	27	6	90
Total	82	54	1	53	19	48	8	265

[a] SLP = Southern Lower Peninsula, NLP = Northern Lower Peninsula, and UP = Upper Peninsula.
[b] MBBA II breeding status: PO = possible, PR = probable, and CO = confirmed.

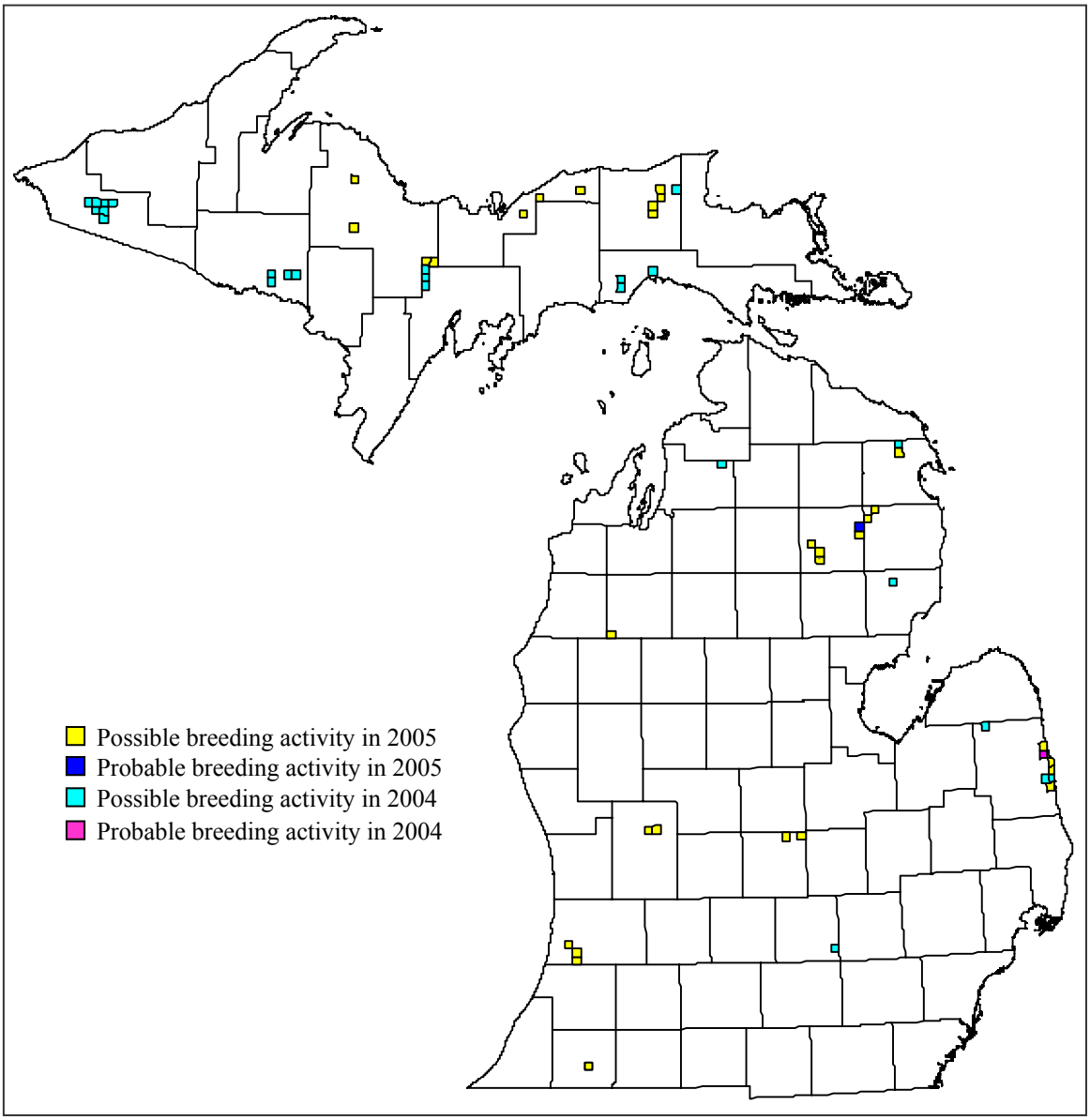

Figure 2. Observed breeding status for Northern Saw-whet Owl by MBBA II survey block as determined from surveys conducted in Michigan during 2004 and 2005.

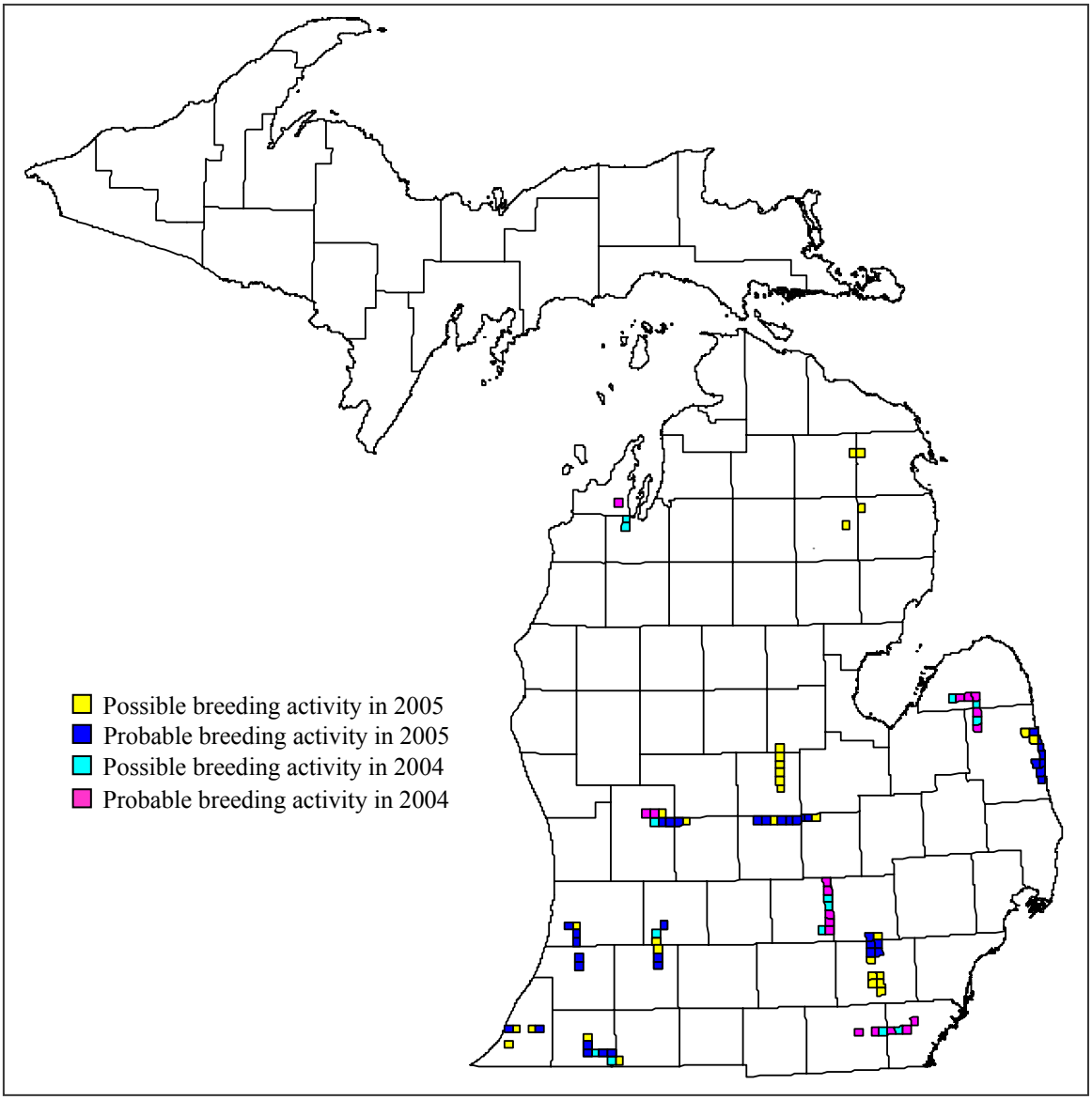

Figure 3. Observed breeding status for Eastern Screech-owl by MBBA II survey block as determined from surveys conducted in Michigan during 2004 and 2005.

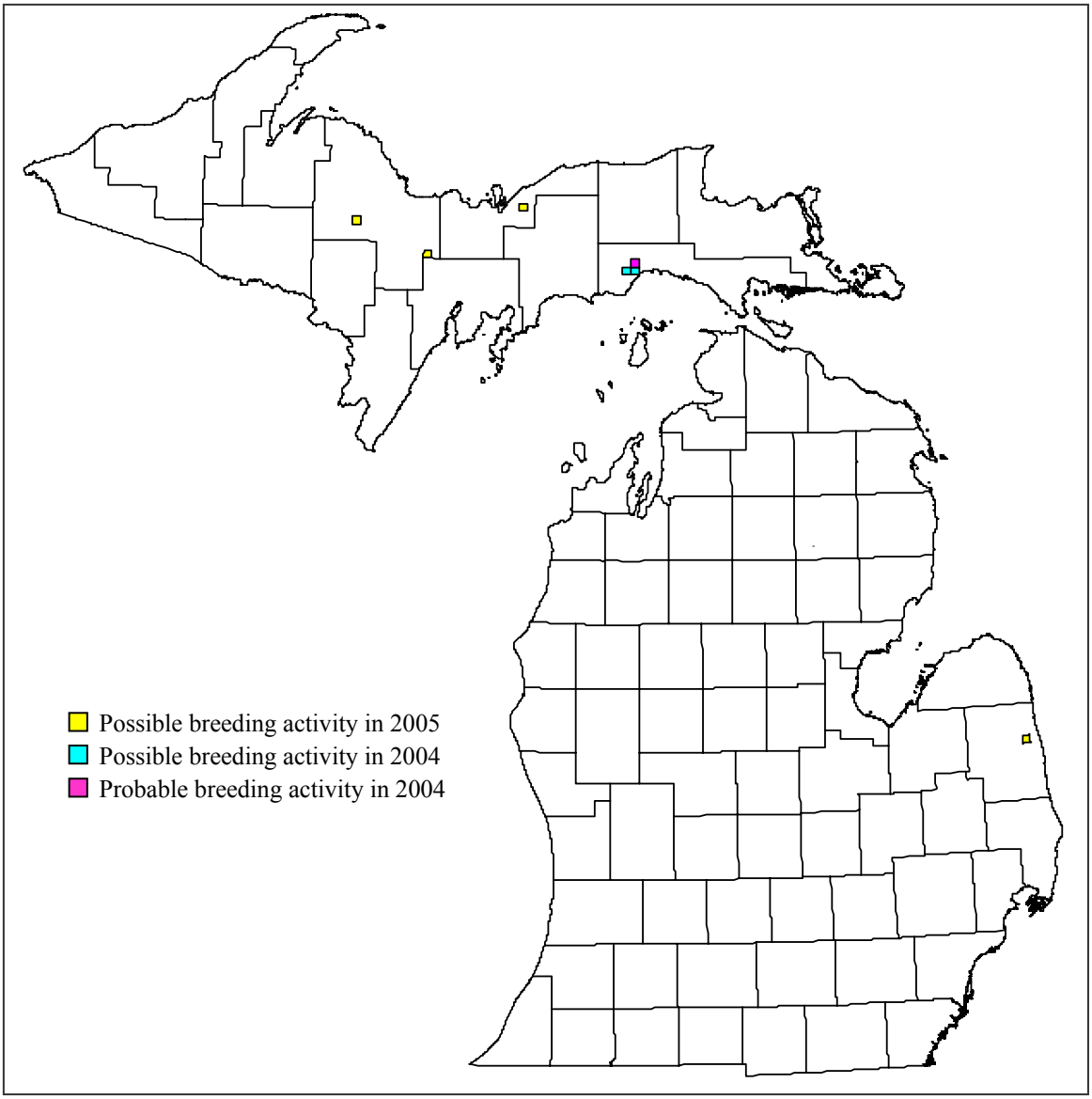

Figure 4. Observed breeding status for Long-eared Owl by MBBA II survey block as determined from surveys conducted in Michigan during 2004 and 2005.

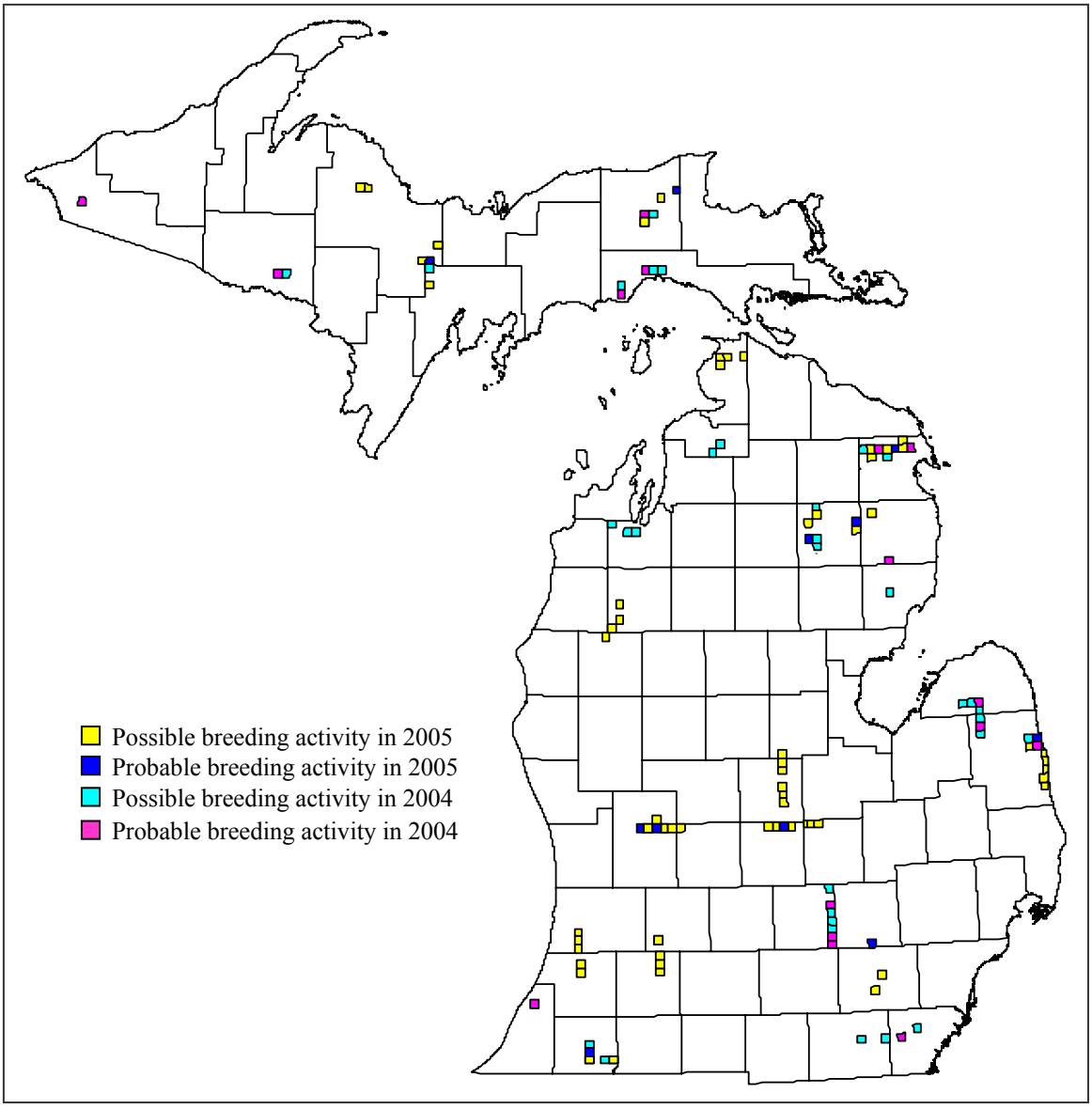

Figure 5. Observed breeding status for Great Horned Owl by MBBA II survey block as determined from surveys conducted in Michigan during 2004 and 2005.

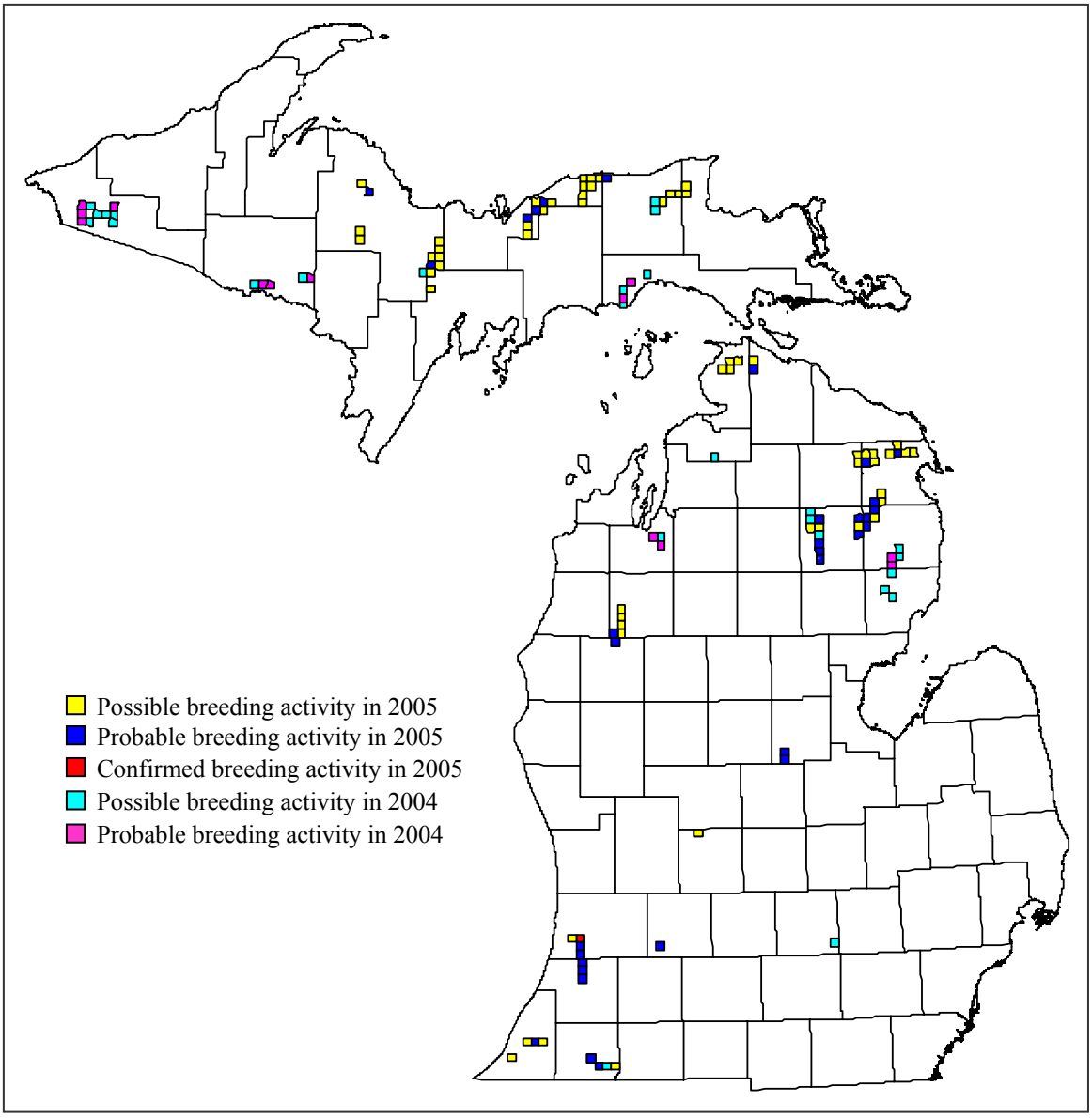

Figure 6. Observed breeding status for Barred Owl by MBBA II survey block as determined from surveys conducted in Michigan during 2004 and 2005.

Table 3. Number of blocks with incidental species observations by region and breeding status (according to MBBA II criteria) from owl surveys conducted in Michigan in 2005.

	SLP		NLP		UP		
Species	**Possible**	**Probable**	**Possible**	**Probable**	**Possible**	**Probable**	**Total**
Common Loon	---	---	1	---	1	---	2
American Bittern	---	---	---	---	2	---	2
Mute Swan	2	---	---	---	---	---	2
Canada Goose	14	3	---	---	---	---	17
Mallard	---	---	---	---	1	---	1
Ring-necked Pheasant	2	---	---	---	---	---	2
Ruffed Grouse	---	---	---	---	1	---	1
Sora	1	---	2	---	---	---	3
American Coot	1	---	---	---	---	---	1
Sandhill Crane	1	---	---	---	1	---	2
Killdeer	5	---	---	---	2	---	7
American Woodcock	3	---	2	5	2	2	14
Common Raven	---	---	---	---	1	---	1
Swainson's Thrush	---	---	---	---	1	---	1
Hermit Thrush	---	---	---	---	1	---	1
American Robin	2	---	---	---	1	---	3
Chipping Sparrow	---	---	---	---	2	---	2
Field Sparrow	3	---	---	---	---	---	3
White-throated Sparrow	---	---	1	---	7	---	8
Eastern Meadowlark	1	---	---	---	---	---	1
Red-winged Blackbird	1	---	---	---	---	---	1
Total	36	3	6	5	23	2	75

During the fourth survey period, significantly fewer Great Horned Owl responses were observed after conspecific broadcast than before when we compared the first silent period with the Great Horned Owl broadcast period ($p \leq 0.022$). When we compared four-min blocks (first silent + Northern Saw-whet Owl or Boreal Owl periods vs. Great Horned Owl + final silent periods), the number of responses were similar during all survey periods.

Preliminary Chi-square analyses indicated that woodland owl presence/absence may be associated with some of the environmental variables measured in this study (Table 4). Time of night appeared to be associated with the presence of Eastern Screech-Owl in the first period and Great Horned Owl in the first and second periods. Both species appeared to be present on fewer points than expected in the late evening and at more points than expected later in the night. The presence of all three species was associated with temperature during at least one survey. In the first survey Eastern Screech-Owls were recorded less than expected in the two coldest categories and more often than expected in the warmer categories. During the second survey they were observed on more points than expected in the second, third, and fourth categories. We recorded Great Horned Owls more often than would be expected randomly in the warmest category and less than or similar to expected values in the remaining categories during the first survey. Barred Owl presence appeared to be associated with temperature in three of four surveys; however, there was no consistent pattern among surveys. Barred Owl was the only species whose presence seemed to be associated with wind speed. During both the second and third periods, Barred Owl was present at more points than expected in the lowest wind category and at fewer points in the second and third categories. Barred Owl was present on more points than expected in the fourth wind category during the third period. In both the first and second surveys, Eastern Screech-

Table 4. Probabilities from Chi-square analyses conducted by species and survey period to test the independence of owl presence and absence frequencies from environmental variable frequencies during surveys conducted in Michigan in 2005. P-values less than 0.05 are in bold and arrows and equal signs indicate whether the number of points with owls present was higher, lower, or similar to what would be expected randomly.

		Environmental Variable and Category[a]																						
		Time			**Temperature**					**Wind Speed**					**Cloud Cover**					**Moon Vis.**			**Noise Level**			
Species	**Survey[b]**	**1**	**2**	**3**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**1**	**2**	**3**	**4**
Eastern Screech-Owl	1 (n=169)	**0.0086**				**0.0012**					0.2468					**0.0137**					0.1111			0.2331		
		↓	↑	↑	↓	↓	↑	↑	↑						↓	=	=	=	↑							
	2 (n=167)	0.8927				**0.0253**					0.2235					**0.0009**					0.0838			0.2311		
					↓	↑	↑	↑	↓						↓	=	=	↑	=							
	3 (n=167)	0.5357				0.8590					0.2276					0.6437					0.1838			**0.0387**		
																							↑	=	↓	=
	4 (n=162)	0.6529				0.0626					0.2381					0.2097					0.9611			0.5995		
Great Horned Owl	1 (n=169)	**0.0385**				**0.0040**					0.4926					**0.0019**					0.3314			**0.0253**		
		↓	=	↑	↓	=	↓	=	↑						↓	=	=	=	↑				=	↑	↓	=
	2 (n=378)	**0.0366**				0.1002					0.1434					0.8416					0.1062			**0.0028**		
		↓	↑	=																			↑	=	↓	↓
	3 (n=375)	0.1794				0.2233					0.8372					**0.0001**					0.0756			0.4053		
															=	=	↑	=	↓							
	4 (n=378)	0.9117				0.3274					0.9702					0.4887					0.6360			0.4935		
Barred Owl	1 (n=169)	0.2786				0.4201					0.5899					0.7941					0.2211			0.1115		
	2 (n=378)	0.8260				**0.0089**					**0.0317**					0.3017					0.0723			**0.0156**		
					↑	↑	=	↓	↓	↑	↓	↓	=	=										↑	=	↓	↓
	3 (n=375)	0.4423				**0.0001**					**0.0085**					0.2558					**0.0062**			0.1591		
					↓	↓	↑	↑	↓	↑	↓	↓	↑	=							↑	↓	↓				
	4 (n=370)	0.2354				**<0.0001**					0.0846					**0.0017**					0.0765			**<0.0001**		
					↑	↓	↓	↑	=						↑	=	=	↓	↓					↑	=	↓	↓

[a] Time: time of night (1=late evening, 2=middle of night, and 3=early morning); Temperature: 5 categories (1 being the coldest and 5 the warmest category); Wind Speed: 5 categories (1 being the lowest and 5 the highest wind speed category); Cloud Cover: 5 categories (1 being the least cloudy and 5 the most cloudy category); Moon Visibility: 1=not visible, 2=partially visible, and 3=completely visible; and Noise Level: 4 levels(1 being silent and 4 being continuous noise).
[b] Survey Period. The number of survey points per period is listed in ().

Owl appeared to be present less often than expected in the lowest cloud cover category and more often in either the fourth or fifth categories. Great Horned Owl presence seemed to be associated with cloud cover during the first and third surveys, but the relationship with the cloud cover categories varied between surveys. During the fourth survey we recorded Barred Owl on more points than expected in the lowest cloud cover category and less often in the two highest categories. Barred Owl was the only species that appeared to be associated with moon visibility, being present on more points than expected when the moon was not visible. All three species appeared to be associated with noise level during at least one survey period. Owls were recorded on more points than would be expected in the two lowest noise categories and less often than expected in the two highest noise categories.

DISCUSSION

Atlas Data

Although the 2005 owl survey documented 634 owl observations in 265 MBBA II survey blocks, it required substantial effort, including nearly 1,250 man-hours of survey time. Long-term focused owl surveys are clearly needed to adequately monitor these species. While monitoring data are needed for all owl species, they are especially important for rare species such as the State-threatened Long-eared Owl, which we only observed on four survey blocks. Additional surveys will provide for increased coverage of the State for Atlas purposes, refinement of survey protocols, a better understanding of breeding phenology and landscape habitat use, and additional opportunities to document rare owl species.

Survey Efficacy

Our observation of likely repeat detections of individual owls on adjacent survey points highlights the need for research that investigates the optimal spacing of survey points for target owl species. While overall estimated repeat detection rates were low (<7%) in this study, repeat detections could be substantial for some species in particular zones of the state (e.g. 12% of UP Great Horned Owl records). Greater spacing of points may be warranted for surveys that aim to estimate population size.

In 2005 a fourth survey period (mid April – mid May) was added in an effort to increase detections of late-nesting species. This later survey resulted in increased owl observations. Barred Owl observation rates increased substantially during this period in the NLP, but only slightly in the SLP and UP. No other species were observed at higher rates during the fourth period. Because Barred Owls typically nest later than other species, such as Eastern Screech-Owl and Great Horned Owl, it is not surprising that detectability was highest during the last survey. Ebbers (1991) noted that courtship usually begins in late winter and vocalizations increase in intensity until egg-laying, which spans early March to early May (Ebbers 1991). We found that the first and second survey periods were best for detecting Eastern Screech-Owls, which is similar to what we observed in 2004. Because Northern Saw-whet Owl, Long-eared Owl, and Great Horned Owl observation rates were low and variable, optimal survey dates remain unclear.

A number of studies have shown increased rates of calling in response to broadcast conspecific calls for several owl species (Fuller and Mosher 1981, Gerhardt 1991, Morrell et al. 1991, Hardy and Morrison 2000, Proudfoot et al. 2002). While Eastern Screech-Owls were consistently recorded more often after broadcast, we did not observe similar patterns for the other species. Unlike previous research, during some survey periods we observed fewer Barred and Great Horned Owl responses after conspecific broadcast compared to before. However, our study was not specifically designed to test broadcast effectiveness, and it is unknown what affect

the playing of calls from several species prior to the Barred and Great Horned Owl broadcasts had on their responsiveness. McGarigal and Fraser (1985) observed a 62.5% Barred Owl response rate to broadcast conspecific calls; however, the authors did not include a prebroadcast period to determine if calls increased owl detections. Barred Owl was the only species observed at a higher rate after conspecific broadcasts were played during surveys conducted in Alberta (Takats and Holroyd 1997). More research is needed before conclusions can be made about the effectiveness of broadcast call techniques for owl surveys in Michigan.

While preliminary Chi-square analyses indicated that owl presence might be related to several environmental factors, the results were often inconsistent both within and among species. The utility of the Chi-square analyses was limited in some cases by the low number of points that fell within some of the environmental categories. Eastern Screech-Owl, Great Horned Owl, and Barred Owl presence appeared to be associated with noise level in that owls were observed at fewer points than expected when the noise level was at 3 or 4. This finding is consistent with our field observations. We observed fewer Eastern Screech-Owls and Great Horned Owls than expected in late evening during some survey periods. This observation could also be related to noise level, because we typically had more automobile traffic during this period, which was a common source of noise. More data and analysis are needed before conclusions can be made about the potential associations of these variables with owl presence. We believe likelihood-based detectability models may help elucidate if these environmental factors affect the detectability of woodland owls.

Additional research is needed to determine if broadcast call surveys are effective for all owl species, what the optimal spacing of survey stations is for each target species, the effective distance covered by broadcast calls, and the impact of environmental variables on responsiveness and detectability. Data from these and future surveys could be used to investigate if landscape-level habitat affects the presence of forest-nesting owls in Michigan. Research is also needed to improve our understanding of woodland owl nest site selection and productivity in the State. Investigations that explore the effects of forest fragmentation and management on breeding owls would provide valuable information to wildlife managers and conservationists.

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APPENDIX A

Michigan Breeding Bird Atlas Data by Survey Block

Table A-1. Owl observation data by MBBA II survey block from surveys conducted in Michigan in 2005.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
BDOW	BDOW-35-3-1/2	2	4/5/2005	JB	P	01N	10W	11	1	Y	Prairieville	Barry
BDOW	BDOW-21-3-1/2	2	4/15/2005	BN	P	01N	15W	1	1	Y	Lee	Allegan
BDOW	BDOW-21-4-7/8	2	5/4/2005	BN	P	01N	15W	1	1	Y	Lee	Allegan
BDOW	BDOW-21-4-9	1	5/4/2005	BN	X	01N	15W	23	4	Y	Lee	Allegan
BDOW	BDOW-21-2-2	1	2/23/2005	JB	X	01N	15W	24	4	Y	Lee	Allegan
BDOW	BDOW-21-4-10	1	5/5/2005	JB	X	01N	15W	26	4	Y	Lee	Allegan
BDOW	BDOW-21-2-1	1	2/23/2005	JB	X	01N	15W	35	4	Y	Lee	Allegan
BDOW	BDOW-21-4-11	1	5/5/2005	JB	X	01N	15W	35	4	Y	Lee	Allegan
BDOW	BDOW-21-4-12/13	2	5/5/2005	JB	P	01N	15W	35	4	Y	Lee	Allegan
BDOW	BDOW-21-1-1	1	1/28/2005	JB, BN	X	01S	15W	10	1	Y	Columbia	Van Buren
BDOW	BDOW-21-3-3/4	2	4/16/2005	JB	P	01S	15W	10	1	Y	Columbia	Van Buren
BDOW	BDOW-21-4-14	1	5/5/2005	JB	X	01S	15W	10	1	Y	Columbia	Van Buren
BDOW	BDOW-21-3-5	1	4/16/2005	JB	X	01S	15W	26	4	Y	Columbia	Van Buren
BDOW	BDOW-21-4-15	1	5/5/2005	JB	X	01S	15W	26	4	Y	Columbia	Van Buren
BDOW	BDOW-21-4-1	1	5/4/2005	BN	X	02N	15W	33	3	Y	Clyde	Allegan
BDOW	BDOW-21-4-2/3	2	5/4/2005	BN	P	02N	15W	34	4	Y	Clyde	Allegan
BDOW	BDOW-21-4-4	1	5/4/2005	BN	FL	02N	15W	34	4	Y	Clyde	Allegan
BDOW	BDOW-21--4-5/6	2	5/4/2005	BN	P	02N	15W	35	4	Y	Clyde	Allegan
BDOW	BDOW-21-3-6/7	2	4/16/2005	JB	P	02S	15W	15	1	Y	Arlington	Van Buren
BDOW	BDOW-22-3-2	1	4/8/2005	BN	X	06S	17W	8	2	Y	Berrien	Berrien
BDOW	BDOW-22-4-4	1	4/29/2005	JB	X	06S	17W	17	2	Y	Berrien	Berrien
BDOW	BDOW-22-4-2/3	2	4/29/2005	JB	P	06S	18W	13	1	Y	Oronoko	Berrien
BDOW	BDOW-22-3-1	1	4/8/2005	BN	X	06S	18W	16	2	Y	Oronoko	Berrien
BDOW	BDOW-39-3-1	1	4/14/2005	BN	X	07S	13W	26	4	Y	Porter	Cass
BDOW	BDOW-39-1-1	1	1/26/2005	JB	X	07S	14W	5	2	Y	Calvin	Cass
BDOW	BDOW-39-2-5/6	2	3/10/2005	JB, BN	P	07S	14W	8	2	Y	Calvin	Cass
BDOW	BDOW-39-2-1/2	2	3/9/2005	JB, BN	P	07S	14W	9	2	Y	Calvin	Cass
BDOW	BDOW-39-4-4/5	2	5/10/2005	JB	P	07S	14W	9	2	Y	Calvin	Cass
BDOW	BDOW-39-4-3	1	5/10/2005	JB	X	07S	14W	17	2	Y	Calvin	Cass
BDOW	BDOW-39-1-2	1	1/27/2005	JB	X	07S	14W	26	4	Y	Calvin	Cass
BDOW	BDOW-39-2-3/4	2	3/9/2005	JB, BN	P	07S	14W	26	4	Y	Calvin	Cass
BDOW	BDOW-39-3-2/3	2	4/14/2005	BN	P	07S	14W	26	4	Y	Calvin	Cass
BDOW	BDOW-39-4-1/2	2	5/10/2005	BN	P	07S	14W	26	4	Y	Calvin	Cass
BDOW	BDOW-22-4-1	1	4/28/2005	JB	X	07S	19W	7	2	Y	Weesaw	Berrien

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
BDOW	BDOW-34-2-1	1	2/22/2005	MM, JE	X	08N	07W	6	2	Y	Orleans	Ionia
BDOW	BDOW-51-3-3	1	3/25/2005	JE, SW	X	13N	02W	13	1	Y	Jasper	Midland
BDOW	BDOW-51-4-1	1	4/29/2005	JE, SW	X	13N	02W	13	1	Y	Jasper	Midland
BDOW	BDOW-51-2-1	1	2/22/2005	MM, JE	X	13N	02W	25	4	N	Jasper	Midland
BDOW	BDOW-51-3-2	1	3/25/2005	JE, SW	X	13N	02W	25	4	N	Jasper	Midland
BDOW	BDOW-51-3-1	1	3/25/2005	JE, SW	X	13N	02W	26	4	N	Jasper	Midland
BDOW	BDOW-51-4-2/3	2	4/29/2005	JE, SW	P	13N	02W	26	4	N	Jasper	Midland
BDOW	BDOW-128-3-2	1	4/2/2005	MS, JE	X	20N	12W	6	2	N	Newkirk	Lake
BDOW	BDOW-128-3-3	1	4/2/2005	MS, JE	X	20N	12W	6	2	N	Newkirk	Lake
BDOW	BDOW-128-2-1	1	3/8/2005	DC, JE	X	20N	12W	7	2	N	Newkirk	Lake
BDOW	BDOW-128-3-4/5	2	4/2/2005	MS, JE	P	20N	12W	7	2	N	Newkirk	Lake
BDOW	BDOW-128-2-6	1	3/8/2005	DC, JE	X	21N	12W	15	1	N	South Branch	Wexford
BDOW	BDOW-128-2-7	1	3/8/2005	DC, JE	X	21N	12W	15	1	N	South Branch	Wexford
BDOW	BDOW-128-4-1	1	5/1/2005	BY, JE	X	21N	12W	27	4	Y	South Branch	Wexford
BDOW	BDOW-128-3-1	1	4/2/2005	MS, JE	X	21N	12W	32	3	N	South Branch	Wexford
BDOW	BDOW-128-2-2	1	3/8/2005	DC, JE	X	21N	12W	33	3	N	South Branch	Wexford
BDOW	BDOW-128-2-3	1	3/8/2005	DC, JE	X	21N	12W	33	3	N	South Branch	Wexford
BDOW	BDOW-128-2-4/5	2	3/8/2005	DC, JE	P	21N	12W	33	3	N	South Branch	Wexford
BDOW	BDOW-128-2-8	1	3/9/2005	DC, JE	X	22N	12W	14	1	N	Slagle	Wexford
BDOW	BDOW-128-4-2	1	5/2/2005	BY, JE	X	22N	12W	22	4	Y	Slagle	Wexford
BDOW	BDOW-47-3-1/2	2	3/28/2005	MS, JE	P	25N	02E	7	2	Y	Big Creek	Oscoda
BDOW	BDOW-47-4-6	1	5/3/2005	BY, JE	X	25N	02E	7	2	Y	Big Creek	Oscoda
BDOW	BDOW-47-4-7	1	5/3/2005	BY, JE	X	25N	02E	8	2	Y	Big Creek	Oscoda
BDOW	BDOW-47-4-8	1	5/3/2005	BY, JE	X	25N	02E	17	2	Y	Big Creek	Oscoda
BDOW	BDOW-47-3-3/4	2	3/28/2005	MS, JE	P	26N	02E	18	2	N	Big Creek	Oscoda
BDOW	BDOW-47-4-2	1	5/3/2005	BY, JE	X	26N	02E	20	3	Y	Big Creek	Oscoda
BDOW	BDOW-47-2-2	1	2/28/2005	DC, JE	X	26N	02E	29	3	Y	Big Creek	Oscoda
BDOW	BDOW-47-2-3	1	2/28/2005	DC, JE	X	26N	02E	30	3	Y	Big Creek	Oscoda
BDOW	BDOW-47-4-3	1	5/3/2005	BY, JE	X	26N	02E	30	3	Y	Big Creek	Oscoda
BDOW	BDOW-47-4-4/5	2	5/3/2005	BY, JE	P	26N	02E	31	3	Y	Big Creek	Oscoda
BDOW	BDOW-47-2-4	1	2/28/2005	DC, JE	X	26N	02E	32	3	Y	Big Creek	Oscoda
BDOW	BDOW-47-2-5	1	2/28/2005	DC, JE	X	26N	02E	32	3	Y	Big Creek	Oscoda
BDOW	BDOW-47-3-7	1	3/29/2005	MS, JE	X	27N	01E	1	1	Y	Greenwood	Oscoda
BDOW	BDOW-47-3-5	1	3/29/2005	MS, JE	X	27N	01E	13	1	Y	Greenwood	Oscoda

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
BDOW	BDOW-47-3-6	1	3/29/2005	MS, JE	X	27N	02E	6	2	N	Elmer	Oscoda
BDOW	BDOW-60-4-12	1	5/4/2005	BY, JE	X	27N	04E	1	1	Y	Comins	Oscoda
BDOW	BDOW-60-4-13	1	5/4/2005	BY, JE	X	27N	04E	12	1	Y	Comins	Oscoda
BDOW	BDOW-60-4-14	1	5/4/2005	BY, JE	X	27N	04E	12	1	Y	Comins	Oscoda
BDOW	BDOW-60-4-15	1	5/4/2005	BY, JE	X	27N	04E	13	1	Y	Comins	Oscoda
BDOW	BDOW-60-4-16	1	5/4/2005	BY, JE	X	27N	04E	13	1	Y	Comins	Oscoda
BDOW	BDOW-60-2-7/8	2	3/4/2005	DC, JE	P	27N	04E	22	4	N	Comins	Oscoda
BDOW	BDOW-60-4-20/21	1	5/4/2005	BY, JE	P	27N	04E	22	4	N	Comins	Oscoda
BDOW	BDOW-60-2-5	1	3/4/2005	DC, JE	X	27N	04E	23	4	N	Comins	Oscoda
BDOW	BDOW-60-2-6	1	3/4/2005	DC, JE	X	27N	04E	23	4	N	Comins	Oscoda
BDOW	BDOW-60-3-1	1	3/30/2005	MS, JE	X	27N	04E	23	4	N	Comins	Oscoda
BDOW	BDOW-60-4-18	1	5/4/2005	BY, JE	X	27N	04E	23	4	N	Comins	Oscoda
BDOW	BDOW-60-4-19	1	5/4/2005	BY, JE	X	27N	04E	23	4	N	Comins	Oscoda
BDOW	BDOW-60-3-2	1	3/30/2005	MS, JE	X	27N	04E	24	4	N	Comins	Oscoda
BDOW	BDOW-60-4-17	1	5/4/2005	BY, JE	X	27N	04E	24	4	N	Comins	Oscoda
BDOW	BDOW-60-2-3/4	2	3/4/2005	DC, JE	P	27N	05E	18	2	Y	Mitchell	Alcona
BDOW	BDOW-47-2-1	1	2/27/2005	DC, JE	X	28N	02E	30	3	N	Elmer	Oscoda
BDOW	BDOW-47-4-1	1	5/2/2005	BY, JE	X	28N	02E	30	3	N	Elmer	Oscoda
BDOW	BDOW-60-2-1/2	2	3/3/2005	DC, JE	P	28N	04E	36	4	Y	Clinton	Oscoda
BDOW	BDOW-60-3-3	1	3/30/2005	MS, JE	X	28N	04E	36	4	Y	Clinton	Oscoda
BDOW	BDOW-60-4-10/11	2	5/4/2005	BY, JE	P	28N	04E	36	4	Y	Clinton	Oscoda
BDOW	BDOW-60-4-9	1	5/4/2005	BY, JE	X	28N	04E	36	4	Y	Clinton	Oscoda
BDOW	BDOW-60-3-6	1	3/31/2005	MS, JE	X	28N	05E	10	1	N	Mitchell	Alcona
BDOW	BDOW-60-4-5	1	5/3/2005	BY, JE	X	28N	05E	10	1	N	Mitchell	Alcona
BDOW	BDOW-60-4-6	1	5/3/2005	BY, JE	X	28N	05E	22	4	Y	Mitchell	Alcona
BDOW	BDOW-60-3-5	1	3/30/2005	MS, JE	X	28N	05E	28	3	N	Mitchell	Alcona
BDOW	BDOW-60-4-7	1	5/4/2005	BY, JE	X	28N	05E	28	3	N	Mitchell	Alcona
BDOW	BDOW-60-4-8	1	5/4/2005	BY, JE	X	28N	05E	30	3	N	Mitchell	Alcona
BDOW	BDOW-60-3-4	1	3/30/2005	MS, JE	X	28N	05E	32	3	N	Mitchell	Alcona
BDOW	BDOW-60-4-4	1	5/3/2005	BY, JE	X	29N	05E	35	4	N	Ossineke	Alpena
BDOW	BDOW-60-4-2/3	1	5/3/2005	BY, JE	P	29N	05E	36	4	N	Ossineke	Alpena
BDOW	BDOW-60-3-8	1	3/31/2005	MS, JE	X	29N	06E	7	2	N	Ossineke	Alpena
BDOW	BDOW-60-3-7	1	3/31/2005	MS, JE	X	29N	06E	30	3	Y	Ossineke	Alpena
BDOW	BDOW-60-4-1	1	5/3/2005	BY, JE	X	29N	06E	31	3	Y	Ossineke	Alpena

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
BDOW	BDOW-59-3-1	1	3/29/2005	MS, JE	X	31N	04E	1	1	N	Hillman	Montmorency
BDOW	BDOW-59-4-10	1	5/5/2005	BY, JE	X	31N	05E	1	1	Y	Wellington	Alpena
BDOW	BDOW-59-4-11	1	5/5/2005	BY, JE	X	31N	05E	3	1	Y	Wellington	Alpena
BDOW	BDOW-59-3-3	1	3/29/2005	MS, JE	X	31N	05E	4	2	Y	Wellington	Alpena
BDOW	BDOW-59-4-12	1	5/5/2005	BY, JE	X	31N	05E	4	2	Y	Wellington	Alpena
BDOW	BDOW-59-4-13	1	5/5/2005	BY, JE	X	31N	05E	5	2	Y	Wellington	Alpena
BDOW	BDOW-59-3-2	1	3/29/2005	MS, JE	X	31N	05E	6	2	Y	Wellington	Alpena
BDOW	BDOW-59-4-15	1	5/5/2005	BY, JE	X	31N	05E	6	2	Y	Wellington	Alpena
BDOW	BDOW-59-4-16	1	5/5/2005	BY, JE	X	32N	04E	36	4	Y	Montmorency	Montmorency
BDOW	BDOW-59-4-17	1	5/5/2005	BY, JE	X	32N	04E	36	4	Y	Montmorency	Montmorency
BDOW	BDOW-59-4-14	1	5/5/2005	BY, JE	X	32N	05E	33	3	N	Wellington	Alpena
BDOW	BDOW-59-4-9	1	5/5/2005	BY, JE	X	32N	05E	35	4	Y	Wellington	Alpena
BDOW	BDOW-59-4-6	1	5/5/2005	BY, JE	X	32N	06E	35	4	N	Long Rapids	Alpena
BDOW	BDOW-59-4-8	1	5/5/2005	BY, JE	X	32N	06E	35	4	N	Long Rapids	Alpena
BDOW	BDOW-59-4-7	1	5/5/2005	BY, JE	X	32N	06E	36	4	N	Long Rapids	Alpena
BDOW	BDOW-59-4-4	1	5/4/2005	BY, JE	X	32N	07E	16	2	Y	Maple Ridge	Alpena
BDOW	BDOW-59-2-1	1	3/2/2005	DC, JE	X	32N	07E	20	3	N	Maple Ridge	Alpena
BDOW	BDOW-59-3-4	1	3/30/2005	MS, JE	X	32N	07E	21	3	N	Maple Ridge	Alpena
BDOW	BDOW-59-4-3	1	5/4/2005	BY, JE	X	32N	07E	21	3	N	Maple Ridge	Alpena
BDOW	BDOW-59-4-2	1	5/4/2005	BY, JE	X	32N	07E	22	4	N	Maple Ridge	Alpena
BDOW	BDOW-59-4-1	1	5/4/2005	BY, JE	X	32N	07E	23	4	N	Maple Ridge	Alpena
BDOW	BDOW-59-4-5	1	5/4/2005	BY, JE	X	32N	07E	30	3	N	Maple Ridge	Alpena
BDOW	BDOW-59-3-5	1	3/30/2005	MS, JE	X	32N	08E	19	3	N	Alpena	Alpena
BDOW	BDOW-42-2-1	1	3/4/2005	DC, JE	X	37N	03W	4	2	Y	Munro	Cheboygan
BDOW	BDOW-42-3-4	1	4/5/2005	JE, KB	X	37N	03W	4	2	Y	Munro	Cheboygan
BDOW	BDOW-42-2-2	1	3/5/2005	DC, JE	X	37N	05W	4	2	N	Center	Emmet
BDOW	BDOW-42-4-3	1	5/6/2005	BY, JE	X	37N	05W	10	1	Y	Center	Emmet
BDOW	BDOW-42-3-3	1	4/5/2005	JE, KB	X	38N	03W	32	3	N	Hebron	Cheboygan
BDOW	BDOW-42-4-1	1	5/5/2005	BY, JE	X	38N	03W	33	3	N	Hebron	Cheboygan
BDOW	BDOW-42-3-2	1	4/4/2005	JE, KB	X	38N	04W	28	3	N	Carp Lake	Emmet
BDOW	BDOW-42-4-2	1	5/6/2005	BY, JE	X	38N	05W	22	4	N	Bliss	Emmet
BDOW	BDOW-42-3-1	1	4/4/2005	JE, KB	X	38N	05W	24	4	N	Bliss	Emmet
BDOW	BDOW-9-3-7	1	4/9/2005	JE, KB	X	42N	23W	7	2	N	Maple Ridge	Delta
BDOW	BDOW-9-2-1	1	3/13/2005	DC, JE	X	43N	23W	5	2	Y	Maple Ridge	Delta

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
BDOW	BDOW-9-2-2	1	3/13/2005	DC, JE	X	43N	23W	8	2	Y	Maple Ridge	Delta
BDOW	BDOW-9-3-2	1	4/8/2005	JE, KB	X	44N	23W	2	1	N	Turin	Marquette
BDOW	BDOW-9-4-8	1	5/10/2005	BY, JE	X	44N	23W	3	1	N	Turin	Marquette
BDOW	BDOW-9-4-9	1	5/10/2005	BY, JE	X	44N	23W	11	1	N	Turin	Marquette
BDOW	BDOW-9-4-7	1	5/10/2005	BY, JE	X	44N	23W	14	1	N	Turin	Marquette
BDOW	BDOW-9-3-3	1	4/8/2005	JE, KB	X	44N	23W	15	1	N	Turin	Marquette
BDOW	BDOW-9-4-6	1	5/10/2005	BY, JE	X	44N	23W	16	2	N	Turin	Marquette
BDOW	BDOW-9-3-6	1	4/8/2005	JE, KB	X	44N	23W	19	3	Y	Turin	Marquette
BDOW	BDOW-9-4-3	1	5/10/2005	BY, JE	X	44N	23W	19	3	Y	Turin	Marquette
BDOW	BDOW-9-3-5	1	4/8/2005	JE, KB	X	44N	23W	20	3	Y	Turin	Marquette
BDOW	BDOW-9-2-3	1	3/13/2005	DC, JE	X	44N	23W	21	3	Y	Turin	Marquette
BDOW	BDOW-9-4-5	1	5/10/2005	BY, JE	X	44N	23W	21	3	Y	Turin	Marquette
BDOW	BDOW-9-3-4	1	4/8/2005	JE, KB	X	44N	23W	22	4	N	Turin	Marquette
BDOW	BDOW-9-4-4	1	5/10/2005	BY, JE	X	44N	23W	27	4	N	Turin	Marquette
BDOW	BDOW-9-4-1	1	5/10/2005	BY, JE	X	44N	23W	30	3	Y	Turin	Marquette
BDOW	BDOW-9-4-2	1	5/10/2005	BY, JE	X	44N	23W	30	3	Y	Turin	Marquette
BDOW	BDOW-9-4-11	1	5/10/2005	BY, JE	X	45N	23W	15	1	Y	Skandia	Marquette
BDOW	BDOW-9-3-1	1	4/8/2005	JE, KB	X	45N	23W	26	4	N	Skandia	Marquette
BDOW	BDOW-9-4-10	1	5/10/2005	BY, JE	X	45N	23W	27	4	N	Skandia	Marquette
BDOW	BDOW-10-3-3	1	4/10/2005	JE, KB	X	45N	28W	2	1	N	Ely	Marquette
BDOW	BDOW-14-3-8	1	4/7/2005	JE, KB	X	46N	17W	5	2	N	Munising	Alger
BDOW	BDOW-14-3-9	1	4/7/2005	JE, KB	X	46N	17W	20	3	N	Munising	Alger
BDOW	BDOW-14-4-1	1	5/8/2005	BY, JE	X	46N	17W	29	3	N	Munising	Alger
BDOW	BDOW-14-3-10	1	4/7/2005	JE, KB	X	46N	17W	30	3	N	Munising	Alger
BDOW	BDOW-10-3-2	1	4/10/2005	JE, KB	X	46N	28W	35	4	N	Ely	Marquette
BDOW	BDOW-14-4-8	1	5/9/2005	BY, JE	X	47N	16W	6	2	N	Hiawatha	Schoolcraft
BDOW	BDOW-14-3-5	1	4/7/2005	JE, KB	X	47N	17W	1	1	N	Munising	Alger
BDOW	BDOW-14-4-7	1	5/9/2005	BY, JE	X	47N	17W	1	1	N	Munising	Alger
BDOW	BDOW-14-4-6	1	5/9/2005	BY, JE	X	47N	17W	15	1	N	Munising	Alger
BDOW	BDOW-14-3-6	1	4/7/2005	JE, KB	X	47N	17W	28	3	N	Munising	Alger
BDOW	BDOW-14-4-3	1	5/9/2005	BY, JE	X	47N	17W	28	3	N	Munising	Alger
BDOW	BDOW-14-4-4	1	5/9/2005	BY, JE	X	47N	17W	28	3	N	Munising	Alger
BDOW	BDOW-14-4-5	1	5/9/2005	BY, JE	X	47N	17W	28	3	N	Munising	Alger
BDOW	BDOW-14-3-7	1	4/7/2005	JE, KB	X	47N	17W	32	3	N	Munising	Alger

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
BDOW	BDOW-14-4-2	1	5/8/2005	BY, JE	X	47N	17W	33	3	N	Munising	Alger
BDOW	BDOW-24-4-2	1	5/6/2005	BY, JE	X	48N	07W	6	2	N	Whitefish	Chippewa
BDOW	BDOW-24-4-5	1	5/6/2005	BY, JE	X	48N	08W	7	2	N	McMillan	Luce
BDOW	BDOW-24-4-3	1	5/6/2005	BY, JE	X	48N	08W	12	1	Y	McMillan	Luce
BDOW	BDOW-24-4-4	1	5/6/2005	BY, JE	X	48N	08W	14	1	Y	McMillan	Luce
BDOW	BDOW-24-3-3	1	4/6/2005	JE, KB	X	48N	08W	18	2	N	McMillan	Luce
BDOW	BDOW-24-3-2	1	4/6/2005	JE, KB	X	48N	09W	23	4	N	McMillan	Luce
BDOW	BDOW-24-3-1	1	4/5/2005	JE, KB	X	48N	09W	27	4	N	McMillan	Luce
BDOW	BDOW-23-3-1	1	4/5/2005	JE, KB	X	48N	14W	1	1	N	Burt	Alger
BDOW	BDOW-23-4-6	1	5/8/2005	BY, JE	X	48N	14W	12	1	N	Burt	Alger
BDOW	BDOW-23-4-7	1	5/8/2005	BY, JE	X	48N	14W	23	4	N	Burt	Alger
BDOW	BDOW-14-4-9/10	1	5/9/2005	BY, JE	P	48N	16W	31	3	N	Burt	Alger
BDOW	BDOW-14-3-3	1	4/7/2005	JE, KB	X	48N	16W	32	3	N	Burt	Alger
BDOW	BDOW-14-3-1/2	2	4/7/2005	JE, KB	P	48N	16W	33	3	N	Burt	Alger
BDOW	BDOW-14-4-11	1	5/9/2005	BY, JE	X	48N	16W	33	3	N	Burt	Alger
BDOW	BDOW-14-4-13	1	5/9/2005	BY, JE	X	48N	16W	33	3	N	Burt	Alger
BDOW	BDOW-14-4-12	1	5/9/2005	BY, JE	X	48N	16W	34	4	N	Burt	Alger
BDOW	BDOW-14-3-4	1	4/7/2005	JE, KB	X	48N	17W	25	4	N	Munising	Alger
BDOW	BDOW-10-2-4	1	3/13/2005	DC, JE	X	48N	27W	7	2	Y	Ishpeming	Marquette
BDOW	BDOW-10-3-1	1	4/9/2005	JE, KB	X	48N	27W	7	2	Y	Ishpeming	Marquette
BDOW	BDOW-24-4-1	1	5/6/2005	BY, JE	X	49N	07W	32	3	N	Whitefish	Chippewa
BDOW	BDOW-23-3-7	1	4/5/2005	JE, KB	X	49N	12W	5	2	N	McMillan	Luce
BDOW	BDOW-23-3-6	1	4/5/2005	JE, KB	X	49N	12W	7	2	N	McMillan	Luce
BDOW	BDOW-23-4-2	1	5/7/2005	BY, JE	X	49N	12W	7	2	N	McMillan	Luce
BDOW	BDOW-23-4-1	1	5/7/2005	BY, JE	X	49N	13W	1	1	N	Burt	Alger
BDOW	BDOW-23-4-4	1	5/7/2005	BY, JE	X	49N	13W	9	2	N	Burt	Alger
BDOW	BDOW-23-4-3	1	5/7/2005	BY, JE	X	49N	13W	10	1	N	Burt	Alger
BDOW	BDOW-23-3-5	1	4/5/2005	JE, KB	X	49N	13W	12	1	N	Burt	Alger
BDOW	BDOW-23-3-4	1	4/5/2005	JE, KB	X	49N	13W	19	3	N	Burt	Alger
BDOW	BDOW-23-4-5	1	5/8/2005	BY, JE	X	49N	14W	12	1	N	Burt	Alger
BDOW	BDOW-23-3-3	1	4/5/2005	JE, KB	X	49N	14W	25	4	N	Burt	Alger
BDOW	BDOW-23-3-2	1	4/5/2005	JE, KB	X	49N	14W	36	4	N	Burt	Alger
BDOW	BDOW-10-2-1	1	3/12/2005	DC, JE	X	49N	28W	35	4	Y	Champion	Marquette
BDOW	BDOW-10-2-2	1	3/12/2005	DC, JE	X	49N	28W	35	4	Y	Champion	Marquette

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
BDOW	BDOW-10-2-3	1	3/12/2005	DC, JE	X	49N	28W	35	4	Y	Champion	Marquette
EASO	EASO-167-1-2	1	1/30/2005	MM, MS	X	01N	05E	33	3	Y	Hamburg	Livingston
EASO	EASO-167-1-3	1	1/30/2005	MM, MS	X	01N	05E	33	3	Y	Hamburg	Livingston
EASO	EASO-167-2-8/9	2	2/26/2005	MM, JE	P	01N	05E	33	3	Y	Hamburg	Livingston
EASO	EASO-167-4-3	1	4/27/2005	JE, SW	X	01N	05E	33	3	Y	Hamburg	Livingston
EASO	EASO-167-4-4	1	4/27/2005	JE, SW	X	01N	05E	33	3	Y	Hamburg	Livingston
EASO	EASO-167-1-1	1	1/30/2005	MM, MS	X	01N	05E	34	4	Y	Hamburg	Livingston
EASO	EASO-35-1-4	1	2/3/2005	BN	X	01N	10W	25	4	Y	Prairieville	Barry
EASO	EASO-35-2-1	1	3/8/2005	BN	X	01N	10W	26	4	Y	Prairieville	Barry
EASO	EASO-21-3-2	1	4/15/2005	BN	X	01N	15W	1	1	Y	Lee	Allegan
EASO	EASO-21-4-1	1	5/4/2005	BN	X	01N	15W	1	1	Y	Lee	Allegan
EASO	EASO-21-2-5	1	2/23/2005	JB	X	01N	15W	14	1	Y	Lee	Allegan
EASO	EASO-21-3-3	1	4/15/2005	BN	X	01N	15W	14	1	Y	Lee	Allegan
EASO	EASO-21-3-4	1	4/15/2005	BN	X	01N	15W	26	4	Y	Lee	Allegan
EASO	EASO-21-4-2	1	5/5/2005	JB	X	01N	15W	26	4	Y	Lee	Allegan
EASO	EASO-21-2-4	1	2/23/2005	JB	X	01N	15W	35	4	Y	Lee	Allegan
EASO	EASO-167-3-1	1	3/21/2005	JE, SW	X	01S	05E	8	2	Y	Webster	Washtenaw
EASO	EASO-167-4-2	1	4/27/2005	JE, SW	X	01S	05E	8	2	Y	Webster	Washtenaw
EASO	EASO-167-1-4/5	2	1/30/2005	MM, MS	P	01S	05E	10	1	Y	Webster	Washtenaw
EASO	EASO-167-2-6/7	2	2/26/2005	MM, JE	P	01S	05E	10	1	Y	Webster	Washtenaw
EASO	EASO-167-2-4	1	2/26/2005	MM, JE	X	01S	05E	21	3	Y	Webster	Washtenaw
EASO	EASO-167-3-2	1	3/21/2005	JE, SW	X	01S	05E	21	3	Y	Webster	Washtenaw
EASO	EASO-167-1-6	1	1/31/2005	MM, MS	X	01S	05E	22	4	Y	Webster	Washtenaw
EASO	EASO-167-2-5	1	2/26/2005	MM, JE	X	01S	05E	22	4	Y	Webster	Washtenaw
EASO	EASO-167-4-1	1	4/27/2005	JE, SW	X	01S	05E	22	4	Y	Webster	Washtenaw
EASO	EASO-167-1-7	1	1/31/2005	MM, MS	X	01S	05E	28	3	Y	Webster	Washtenaw
EASO	EASO-167-1-8	1	1/31/2005	MM, MS	X	01S	05E	28	3	Y	Webster	Washtenaw
EASO	EASO-167-1-10	1	1/31/2005	MM, MS	X	01S	05E	34	4	Y	Webster	Washtenaw
EASO	EASO-167-1-9	1	1/31/2005	MM, MS	X	01S	05E	34	4	Y	Webster	Washtenaw
EASO	EASO-167-2-3	1	2/26/2005	MM, JE	X	01S	05E	34	4	Y	Webster	Washtenaw
EASO	EASO-167-3-3	1	3/21/2005	JE, SW	X	01S	05E	34	4	Y	Webster	Washtenaw
EASO	EASO-35-4-4	1	5/5/2005	JB	X	01S	10W	13	1	Y	Richland	Kalamazoo
EASO	EASO-35-1-2	1	2/2/2005	BN	X	01S	10W	25	4	Y	Richland	Kalamazoo
EASO	EASO-35-1-3	1	2/2/2005	BN	X	01S	10W	25	4	Y	Richland	Kalamazoo

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
EASO	EASO-35-3-1	1	4/4/2005	BN	X	01S	10W	25	4	Y	Richland	Kalamazoo
EASO	EASO-35-4-3	1	5/5/2005	JB	X	01S	10W	25	4	Y	Richland	Kalamazoo
EASO	EASO-21-2-3	1	2/23/2005	JB	X	01S	15W	34	4	Y	Columbia	Van Buren
EASO	EASO-21-3-5	1	4/16/2005	JB	X	01S	15W	34	4	Y	Columbia	Van Buren
EASO	EASO-21-4-3	1	5/5/2005	JB	X	01S	15W	34	4	Y	Columbia	Van Buren
EASO	EASO-35-1-5	1	2/3/2005	BN	X	02N	09W	31	3	Y	Hope	Barry
EASO	EASO-35-4-1	1	5/3/2005	BN	X	02N	09W	31	3	Y	Hope	Barry
EASO	EASO-21-2-8	1	2/24/2005	JB	X	02N	15W	33	3	Y	Clyde	Allegan
EASO	EASO-21-3-1	1	4/15/2005	BN	X	02N	15W	33	3	Y	Clyde	Allegan
EASO	EASO-21-2-6	1	2/24/2005	JB	X	02N	15W	35	4	Y	Clyde	Allegan
EASO	EASO-21-2-7	1	2/24/2005	JB	X	02N	15W	35	4	Y	Clyde	Allegan
EASO	EASO-167-3-4	1	3/21/2005	JE, SW	X	02S	05E	4	2	Y	Scio	Washtenaw
EASO	EASO-167-2-2	1	2/26/2005	MM, JE	X	02S	05E	9	2	Y	Scio	Washtenaw
EASO	EASO-35-1-1	1	2/2/2005	BN	X	02S	10W	1	1	Y	Comstock	Kalamazoo
EASO	EASO-35-4-2	1	5/3/2005	BN	X	02S	10W	1	1	Y	Comstock	Kalamazoo
EASO	EASO-21-2-2	1	2/23/2005	JB	X	02S	15W	2	1	Y	Arlington	Van Buren
EASO	EASO-21-4-4	1	5/5/2005	JB	X	02S	15W	2	1	Y	Arlington	Van Buren
EASO	EASO-21-1-1	1	1/28/2005	JB, BN	X	02S	15W	15	1	Y	Arlington	Van Buren
EASO	EASO-21-1-2	1	1/28/2005	JB, BN	X	02S	15W	15	1	Y	Arlington	Van Buren
EASO	EASO-21-2-1	1	2/23/2005	JB	X	02S	15W	15	1	Y	Arlington	Van Buren
EASO	EASO-167-1-11	1	1/31/2005	MM, MS	X	03S	05E	4	2	Y	Lodi	Washtenaw
EASO	EASO-167-1-12	1	1/31/2005	MM, MS	X	03S	05E	15	1	Y	Lodi	Washtenaw
EASO	EASO-167-3-5	1	3/22/2005	JE, SW	X	03S	05E	16	2	Y	Lodi	Washtenaw
EASO	EASO-167-1-13	1	1/31/2005	MM, MS	X	03S	05E	22	4	Y	Lodi	Washtenaw
EASO	EASO-167-1-14	1	1/31/2005	MM, MS	X	03S	05E	22	4	Y	Lodi	Washtenaw
EASO	EASO-167-3-6	1	3/22/2005	JE, SW	X	03S	05E	28	3	Y	Lodi	Washtenaw
EASO	EASO-167-2-1	1	2/25/2005	MM, JE	X	03S	05E	34	4	Y	Lodi	Washtenaw
EASO	EASO-167-1-15	1	1/31/2005	MM, MS	X	04S	05E	3	1	Y	Saline	Washtenaw
EASO	EASO-39-2-9	1	3/10/2005	JB, BN	X	06S	14W	29	3	Y	Penn	Cass
EASO	EASO-39-4-9	1	5/10/2005	JB	X	06S	14W	33	3	Y	Penn	Cass
EASO	EASO-22-1-5	1	2/1/2005	JB	X	06S	17W	17	2	Y	Berrien	Berrien
EASO	EASO-22-3-4	1	4/8/2005	BN	X	06S	17W	17	2	Y	Berrien	Berrien
EASO	EASO-22-4-3	1	4/29/2005	JB	X	06S	17W	17	2	Y	Berrien	Berrien
EASO	EASO-22-1-4	1	2/1/2005	JB	X	06S	17W	18	2	Y	Berrien	Berrien

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
EASO	EASO-22-4-2	1	4/29/2005	JB	X	06S	17W	18	2	Y	Berrien	Berrien
EASO	EASO-22-1-3	1	1/31/2005	JB	X	06S	18W	3	1	Y	Oronoko	Berrien
EASO	EASO-22-3-3	1	4/8/2005	BN	X	06S	18W	15	1	Y	Oronoko	Berrien
EASO	EASO-22-3-2	1	4/8/2005	BN	X	06S	19W	3	1	Y	Baroda	Berrien
EASO	EASO-22-2-1	1	3/3/2005	JB	X	06S	19W	4	2	Y	Lake	Berrien
EASO	EASO-22-3-1	1	4/8/2005	BN	X	06S	19W	4	2	Y	Lake	Berrien
EASO	EASO-22-4-1	1	4/28/2005	JB	X	06S	19W	4	2	Y	Lake	Berrien
EASO	EASO-22-1-2	1	1/31/2005	JB	X	06S	19W	8	2	Y	Lake	Berrien
EASO	EASO-22-2-2	1	3/4/2005	JB	X	06S	19W	17	2	Y	Lake	Berrien
EASO	EASO-39-1-7	1	1/27/2005	JB	X	07S	13W	27	4	Y	Porter	Cass
EASO	EASO-39-2-6	1	3/9/2005	JB, BN	X	07S	13W	27	4	Y	Porter	Cass
EASO	EASO-39-3-3	1	4/14/2005	BN	X	07S	13W	27	4	Y	Porter	Cass
EASO	EASO-39-4-2/3	2	5/10/2005	BN	P	07S	13W	27	4	Y	Porter	Cass
EASO	EASO-39-1-6	1	1/27/2005	JB	X	07S	13W	28	3	Y	Porter	Cass
EASO	EASO-39-2-3	1	3/9/2005	JB, BN	X	07S	13W	30	3	Y	Porter	Cass
EASO	EASO-39-3-5	1	4/14/2005	BN	X	07S	13W	30	3	Y	Porter	Cass
EASO	EASO-39-2-7	1	3/9/2005	JB, BN	X	07S	13W	32	3	Y	Porter	Cass
EASO	EASO-39-3-4	1	4/14/2005	BN	X	07S	13W	32	3	Y	Porter	Cass
EASO	EASO-39-4-1	1	5/10/2005	BN	X	07S	13W	32	3	Y	Porter	Cass
EASO	EASO-39-1-8	1	1/27/2005	JB	X	07S	13W	36	4	Y	Porter	Cass
EASO	EASO-39-2-2	1	3/9/2005	JB, BN	X	07S	13W	36	4	Y	Porter	Cass
EASO	EASO-39-2-5	1	3/9/2005	JB, BN	X	07S	13W	36	4	Y	Porter	Cass
EASO	EASO-39-3-1	1	4/14/2005	BN	X	07S	13W	36	4	Y	Porter	Cass
EASO	EASO-39-3-2	1	4/14/2005	BN	X	07S	13W	36	4	Y	Porter	Cass
EASO	EASO-39-4-4	1	5/10/2005	BN	X	07S	13W	36	4	Y	Porter	Cass
EASO	EASO-39-2-8	1	3/10/2005	JB, BN	X	07S	14W	4	2	Y	Calvin	Cass
EASO	EASO-39-3-6	1	4/14/2005	JB	X	07S	14W	4	2	Y	Calvin	Cass
EASO	EASO-39-3-7/8	2	4/14/2005	JB	P	07S	14W	8	2	Y	Calvin	Cass
EASO	EASO-39-3-9	1	4/14/2005	JB	X	07S	14W	8	2	Y	Calvin	Cass
EASO	EASO-39-4-6/7	2	5/10/2005	JB	P	07S	14W	8	2	Y	Calvin	Cass
EASO	EASO-39-4-8	1	5/10/2005	JB	X	07S	14W	8	2	Y	Calvin	Cass
EASO	EASO-39-1-2	1	1/26/2005	JB	X	07S	14W	17	2	Y	Calvin	Cass
EASO	EASO-39-1-1	1	1/26/2005	JB	X	07S	14W	18	2	Y	Calvin	Cass
EASO	EASO-39-2-4	1	3/9/2005	JB, BN	X	07S	14W	18	2	Y	Calvin	Cass

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
EASO	EASO-39-3-10	1	4/14/2005	JB	X	07S	14W	18	2	Y	Calvin	Cass
EASO	EASO-39-1-3	1	1/26/2005	JB	X	07S	14W	19	3	Y	Calvin	Cass
EASO	EASO-39-4-5	1	5/10/2005	JB	X	07S	14W	19	3	Y	Calvin	Cass
EASO	EASO-39-1-5	1	1/27/2005	JB	X	07S	14W	28	3	Y	Calvin	Cass
EASO	EASO-39-1-4	1	1/26/2005	JB	X	07S	14W	29	3	Y	Calvin	Cass
EASO	EASO-22-1-1	1	1/31/2005	JB	X	07S	19W	8	2	Y	Weesaw	Berrien
EASO	EASO-52-4-1	1	4/28/2005	JE, SW	X	08N	01E	8	2	Y	Fairfield	Shiawassee
EASO	EASO-52-1-15	1	1/25/2005	MM, MS	X	08N	01E	9	2	Y	Fairfield	Shiawassee
EASO	EASO-52-4-2	1	4/28/2005	JE, SW	X	08N	01E	9	2	Y	Fairfield	Shiawassee
EASO	EASO-52-2-2	1	2/24/2005	MM, JE	X	08N	01E	10	1	Y	Fairfield	Shiawassee
EASO	EASO-52-1-17	1	1/26/2005	MM, MS	X	08N	01E	12	1	Y	Fairfield	Shiawassee
EASO	EASO-52-1-18	1	1/26/2005	MM, MS	X	08N	01E	13	1	Y	Fairfield	Shiawassee
EASO	EASO-52-1-16	1	1/26/2005	MM, MS	X	08N	01E	14	1	Y	Fairfield	Shiawassee
EASO	EASO-52-3-3	1	3/23/2005	JE, SW	X	08N	01E	14	1	Y	Fairfield	Shiawassee
EASO	EASO-52-1-14	1	1/25/2005	MM, MS	X	08N	01W	1	1	Y	Duplain	Clinton
EASO	EASO-52-2-3	1	2/24/2005	MM, JE	X	08N	01W	1	1	Y	Duplain	Clinton
EASO	EASO-52-1-10	1	1/25/2005	MM, MS	X	08N	01W	7	2	Y	Duplain	Clinton
EASO	EASO-52-2-10	1	2/25/2005	MM, JE	X	08N	01W	7	2	Y	Duplain	Clinton
EASO	EASO-52-1-11	1	1/25/2005	MM, MS	X	08N	01W	8	2	Y	Duplain	Clinton
EASO	EASO-52-2-8	1	2/25/2005	MM, JE	X	08N	01W	8	2	Y	Duplain	Clinton
EASO	EASO-52-2-9	1	2/25/2005	MM, JE	X	08N	01W	8	2	Y	Duplain	Clinton
EASO	EASO-52-4-4	1	4/29/2005	JE, SW	X	08N	01W	8	2	Y	Duplain	Clinton
EASO	EASO-52-1-12	1	1/25/2005	MM, MS	X	08N	01W	9	2	Y	Duplain	Clinton
EASO	EASO-52-2-6	1	2/25/2005	MM, JE	X	08N	01W	9	2	Y	Duplain	Clinton
EASO	EASO-52-2-7	1	2/25/2005	MM, JE	X	08N	01W	9	2	Y	Duplain	Clinton
EASO	EASO-52-1-13	1	1/25/2005	MM, MS	X	08N	01W	11	1	Y	Duplain	Clinton
EASO	EASO-52-2-4	1	2/24/2005	MM, JE	X	08N	01W	11	1	Y	Duplain	Clinton
EASO	EASO-52-2-5	1	2/24/2005	MM, JE	X	08N	01W	11	1	Y	Duplain	Clinton
EASO	EASO-52-3-2	1	3/23/2005	JE, SW	X	08N	01W	11	1	Y	Duplain	Clinton
EASO	EASO-52-4-3	1	4/29/2005	JE, SW	X	08N	01W	16	2	Y	Duplain	Clinton
EASO	EASO-52-2-1	1	2/24/2005	MM, JE	X	08N	02E	16	2	Y	Rush	Shiawassee
EASO	EASO-52-1-19	1	1/26/2005	MM, MS	X	08N	02E	18	2	Y	Rush	Shiawassee
EASO	EASO-52-4-6	1	4/29/2005	JE, SW	X	08N	02W	9	2	Y	Greenbush	Clinton
EASO	EASO-52-4-5	1	4/29/2005	JE, SW	X	08N	02W	10	1	Y	Greenbush	Clinton

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
EASO	EASO-52-1-7	1	1/25/2005	MM, MS	X	08N	02W	11	1	Y	Greenbush	Clinton
EASO	EASO-52-2-11	1	2/25/2005	MM, JE	X	08N	02W	11	1	Y	Greenbush	Clinton
EASO	EASO-52-1-8	1	1/25/2005	MM, MS	X	08N	02W	12	1	Y	Greenbush	Clinton
EASO	EASO-52-1-9	1	1/25/2005	MM, MS	X	08N	02W	12	1	Y	Greenbush	Clinton
EASO	EASO-52-1-1/2	2	1/25/2005	MM, MS	P	08N	03W	9	2	Y	Essex	Clinton
EASO	EASO-52-2-15	1	2/25/2005	MM, JE	X	08N	03W	9	2	Y	Essex	Clinton
EASO	EASO-52-4-8	1	4/29/2005	JE, SW	X	08N	03W	9	2	Y	Essex	Clinton
EASO	EASO-52-1-3	1	1/25/2005	MM, MS	X	08N	03W	10	1	Y	Essex	Clinton
EASO	EASO-52-1-4	1	1/25/2005	MM, MS	X	08N	03W	10	1	Y	Essex	Clinton
EASO	EASO-52-2-12	1	2/25/2005	MM, JE	X	08N	03W	11	1	Y	Essex	Clinton
EASO	EASO-52-3-1	1	3/22/2005	JE, SW	X	08N	03W	11	1	Y	Essex	Clinton
EASO	EASO-52-1-6	1	1/25/2005	MM, MS	X	08N	03W	12	1	Y	Essex	Clinton
EASO	EASO-52-4-7	1	4/29/2005	JE, SW	X	08N	03W	12	1	Y	Essex	Clinton
EASO	EASO-52-1-5	1	1/25/2005	MM, MS	X	08N	03W	14	1	Y	Essex	Clinton
EASO	EASO-52-2-13	1	2/25/2005	MM, JE	X	08N	03W	14	1	Y	Essex	Clinton
EASO	EASO-52-2-14	1	2/25/2005	MM, JE	X	08N	03W	15	1	Y	Essex	Clinton
EASO	EASO-34-2-5	1	2/22/2005	MM, JE	X	08N	08W	3	1	Y	Belding	Ionia
EASO	EASO-34-1-1	1	1/27/2005	MM, MS	X	08N	08W	5	2	Y	Otisco	Ionia
EASO	EASO-34-2-4	1	2/22/2005	MM, JE	X	08N	08W	5	2	Y	Otisco	Ionia
EASO	EASO-34-3-1	1	3/23/2005	JE, SW	X	08N	08W	5	2	Y	Otisco	Ionia
EASO	EASO-34-3-2	1	3/23/2005	JE, SW	X	08N	08W	6	2	Y	Otisco	Ionia
EASO	EASO-34-3-3	1	3/23/2005	JE, SW	X	08N	08W	6	2	Y	Otisco	Ionia
EASO	EASO-34-2-3	1	2/22/2005	MM, JE	X	08N	08W	7	2	Y	Otisco	Ionia
EASO	EASO-34-2-2	1	2/22/2005	MM, JE	X	08N	09W	1	1	Y	Grattan	Kent
EASO	EASO-34-2-1	1	2/22/2005	MM, JE	X	08N	09W	2	1	Y	Grattan	Kent
EASO	EASO-34-3-4	1	3/23/2005	JE, SW	X	08N	09W	2	1	Y	Grattan	Kent
EASO	EASO-34-1-2	1	1/27/2005	MM, MS	X	08N	09W	4	2	Y	Grattan	Kent
EASO	EASO-34-4-1	1	4/25/2005	JE, SW	X	08N	09W	4	2	Y	Grattan	Kent
EASO	EASO-39-1-10	1	1/27/2005	JB	X	08S	12W	7	2	Y	Mottville	St. Joseph
EASO	EASO-39-1-9	1	1/27/2005	JB	X	08S	12W	7	2	Y	Mottville	St. Joseph
EASO	EASO-39-2-1	1	3/9/2005	JB, BN	X	08S	12W	18	2	Y	Mottville	St. Joseph
EASO	EASO-34-1-3	1	1/27/2005	MM, MS	X	09N	09W	31	3	Y	Oakfield	Kent
EASO	EASO-51-3-1	1	3/24/2005	JE, SW	X	10N	02W	2	1	Y	North Star	Gratiot
EASO	EASO-70-2-5	1	2/23/2005	MM, JE	X	10N	16E	1	1	Y	Lexington	Sanilac

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
EASO	EASO-70-3-9	1	3/21/2005	JE, SW	X	10N	16E	1	1	Y	Lexington	Sanilac
EASO	EASO-70-4-1	1	4/27/2005	JE, SW	X	10N	16E	1	1	Y	Lexington	Sanilac
EASO	EASO-70-1-13	1	1/25/2005	MM, MS	X	10N	16E	2	1	Y	Lexington	Sanilac
EASO	EASO-70-3-8	1	3/21/2005	JE, SW	X	10N	16E	2	1	Y	Lexington	Sanilac
EASO	EASO-70-1-14	1	1/25/2005	MM, MS	X	10N	16E	11	1	Y	Lexington	Sanilac
EASO	EASO-70-2-2/3	2	2/23/2005	MM, JE	P	10N	16E	13	1	Y	Lexington	Sanilac
EASO	EASO-70-3-10	1	3/21/2005	JE, SW	X	10N	16E	13	1	Y	Lexington	Sanilac
EASO	EASO-70-1-15	1	1/25/2005	MM, MS	X	10N	16E	14	1	Y	Lexington	Sanilac
EASO	EASO-70-2-4	1	2/23/2005	MM, JE	X	10N	16E	14	1	Y	Lexington	Sanilac
EASO	EASO-70-1-16	1	1/25/2005	MM, MS	X	10N	16E	24	4	Y	Lexington	Sanilac
EASO	EASO-70-2-1	1	2/23/2005	MM, JE	X	10N	16E	24	4	Y	Lexington	Sanilac
EASO	EASO-51-2-3	1	2/23/2005	MM, JE	X	11N	02W	2	1	Y	Emerson	Gratiot
EASO	EASO-51-4-1	1	4/30/2005	JE, SW	X	11N	02W	23	4	Y	Emerson	Gratiot
EASO	EASO-51-3-2	1	3/24/2005	JE, SW	X	11N	02W	26	4	Y	Emerson	Gratiot
EASO	EASO-70-1-6	1	1/25/2005	MM, MS	X	11N	16E	2	1	Y	Sanilac	Sanilac
EASO	EASO-70-1-7	1	1/25/2005	MM, MS	X	11N	16E	10	1	Y	Sanilac	Sanilac
EASO	EASO-70-2-14	1	2/23/2005	MM, JE	X	11N	16E	10	1	Y	Sanilac	Sanilac
EASO	EASO-70-2-15	1	2/23/2005	MM, JE	X	11N	16E	10	1	Y	Sanilac	Sanilac
EASO	EASO-70-3-4/5	2	3/20/2005	JE, SW	P	11N	16E	10	1	Y	Sanilac	Sanilac
EASO	EASO-70-4-5	1	4/27/2005	JE, SW	X	11N	16E	10	1	Y	Sanilac	Sanilac
EASO	EASO-70-2-13	1	2/23/2005	MM, JE	X	11N	16E	14	1	Y	Sanilac	Sanilac
EASO	EASO-70-1-8	1	1/25/2005	MM, MS	X	11N	16E	26	4	Y	Sanilac	Sanilac
EASO	EASO-70-2-12	1	2/23/2005	MM, JE	X	11N	16E	26	4	Y	Sanilac	Sanilac
EASO	EASO-70-3-6	1	3/21/2005	JE, SW	X	11N	16E	26	4	Y	Sanilac	Sanilac
EASO	EASO-70-4-4	1	4/27/2005	JE, SW	X	11N	16E	26	4	Y	Sanilac	Sanilac
EASO	EASO-70-1-11	1	1/25/2005	MM, MS	X	11N	16E	27	4	Y	Sanilac	Sanilac
EASO	EASO-70-1-9	1	1/25/2005	MM, MS	X	11N	16E	27	4	Y	Sanilac	Sanilac
EASO	EASO-70-2-11	1	2/23/2005	MM, JE	X	11N	16E	28	3	Y	Sanilac	Sanilac
EASO	EASO-70-3-7	1	3/21/2005	JE, SW	X	11N	16E	28	3	Y	Sanilac	Sanilac
EASO	EASO-70-1-10	1	1/25/2005	MM, MS	X	11N	16E	33	3	Y	Sanilac	Sanilac
EASO	EASO-70-1-12	1	1/25/2005	MM, MS	X	11N	16E	33	3	Y	Sanilac	Sanilac
EASO	EASO-70-2-10	1	2/23/2005	MM, JE	X	11N	16E	33	3	Y	Sanilac	Sanilac
EASO	EASO-70-2-8	1	2/23/2005	MM, JE	X	11N	16E	33	3	Y	Sanilac	Sanilac
EASO	EASO-70-2-9	1	2/23/2005	MM, JE	X	11N	16E	33	3	Y	Sanilac	Sanilac

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
EASO	EASO-70-4-2	1	4/27/2005	JE, SW	X	11N	16E	33	3	Y	Sanilac	Sanilac
EASO	EASO-70-4-3	1	4/27/2005	JE, SW	X	11N	16E	33	3	Y	Sanilac	Sanilac
EASO	EASO-70-2-6/7	2	2/23/2005	MM, JE	P	11N	16E	34	4	Y	Sanilac	Sanilac
EASO	EASO-51-2-1	1	2/22/2005	MM, JE	X	12N	02W	14	1	Y	Bethany	Gratiot
EASO	EASO-51-2-2	1	2/22/2005	MM, JE	X	12N	02W	14	1	Y	Bethany	Gratiot
EASO	EASO-51-1-1	1	1/23/2005	MM, MS	X	12N	02W	23	4	Y	Bethany	Gratiot
EASO	EASO-51-1-2	1	1/23/2005	MM, MS	X	12N	02W	23	4	Y	Bethany	Gratiot
EASO	EASO-70-1-2	1	1/24/2005	MM, MS	X	12N	16E	3	1	Y	Forester	Sanilac
EASO	EASO-70-4-7	1	4/28/2005	JE, SW	X	12N	16E	3	1	Y	Forester	Sanilac
EASO	EASO-70-4-8	1	4/28/2005	JE, SW	X	12N	16E	3	1	Y	Forester	Sanilac
EASO	EASO-70-2-19	1	2/24/2005	MM, JE	X	12N	16E	4	2	Y	Forester	Sanilac
EASO	EASO-70-2-20	1	2/24/2005	MM, JE	X	12N	16E	5	2	Y	Forester	Sanilac
EASO	EASO-70-1-3	1	1/24/2005	MM, MS	X	12N	16E	10	1	Y	Forester	Sanilac
EASO	EASO-70-3-2	1	3/20/2005	JE, SW	X	12N	16E	10	1	Y	Forester	Sanilac
EASO	EASO-70-2-17	1	2/23/2005	MM, JE	X	12N	16E	15	1	Y	Forester	Sanilac
EASO	EASO-70-4-6	1	4/28/2005	JE, SW	X	12N	16E	15	1	Y	Forester	Sanilac
EASO	EASO-70-2-16	1	2/23/2005	MM, JE	X	12N	16E	22	4	Y	Sanilac	Sanilac
EASO	EASO-70-3-3	1	3/20/2005	JE, SW	X	12N	16E	22	4	Y	Sanilac	Sanilac
EASO	EASO-70-1-4	1	1/24/2005	MM, MS	X	12N	16E	23	4	Y	Sanilac	Sanilac
EASO	EASO-70-1-5	1	1/25/2005	MM, MS	X	12N	16E	35	4	Y	Sanilac	Sanilac
EASO	EASO-51-3-3	1	3/25/2005	JE, SW	X	13N	02W	34	4	N	Jasper	Midland
EASO	EASO-70-1-1	1	1/24/2005	MM, MS	X	13N	15E	34	4	Y	Marion	Sanilac
EASO	EASO-70-2-23	1	2/24/2005	MM, JE	X	13N	15E	35	4	Y	Marion	Sanilac
EASO	EASO-70-2-24	1	2/24/2005	MM, JE	X	13N	15E	35	4	Y	Marion	Sanilac
EASO	EASO-70-2-22	1	2/24/2005	MM, JE	X	13N	15E	36	4	Y	Marion	Sanilac
EASO	EASO-70-2-21	1	2/24/2005	MM, JE	X	13N	16E	31	3	Y	Forester	Sanilac
EASO	EASO-70-3-1	1	3/20/2005	JE, SW	X	13N	16E	31	3	Y	Forester	Sanilac
EASO	EASO-70-2-18	1	2/24/2005	MM, JE	X	13N	16E	32	3	Y	Forester	Sanilac
EASO	EASO-60-3-1	1	3/30/2005	MS, JE	X	27N	04E	19	3	N	Comins	Oscoda
EASO	EASO-60-3-2	1	3/30/2005	MS, JE	X	28N	05E	29	3	N	Mitchell	Alcona
EASO	EASO-59-4-1	1	5/5/2005	BY, JE	X	31N	04E	1	1	N	Hillman	Montmorency
EASO	EASO-59-3-1	1	3/29/2005	MS, JE	X	31N	05E	4	2	Y	Wellington	Alpena
GHOW	GHOW-167-3-3	1	3/21/2005	JE, SW	X	01N	05E	32	3	Y	Hamburg	Livingston
GHOW	GHOW-167-3-1/2	2	3/21/2005	JE, SW	P	01N	05E	33	3	Y	Hamburg	Livingston

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
GHOW	GHOW-35-4-1	1	5/3/2005	BN	X	01N	10W	1	1	Y	Prairieville	Barry
GHOW	GHOW-21-2-2	1	2/23/2005	JB	X	01N	15W	13	1	Y	Lee	Allegan
GHOW	GHOW-21-3-1	1	4/15/2005	BN	X	01N	15W	24	4	Y	Lee	Allegan
GHOW	GHOW-35-4-2	1	5/5/2005	JB	X	01S	10W	13	1	Y	Richland	Kalamazoo
GHOW	GHOW-35-2-1	1	3/9/2005	JB	X	01S	10W	25	4	Y	Richland	Kalamazoo
GHOW	GHOW-35-2-2	1	3/9/2005	JB	X	01S	10W	25	4	Y	Richland	Kalamazoo
GHOW	GHOW-35-2-3	1	3/9/2005	JB	X	01S	10W	36	4	Y	Richland	Kalamazoo
GHOW	GHOW-21-3-2	1	4/16/2005	JB	X	01S	15W	35	4	Y	Columbia	Van Buren
GHOW	GHOW-21-2-3	1	2/24/2005	JB	X	02N	15W	35	4	Y	Clyde	Allegan
GHOW	GHOW-167-3-4	1	3/21/2005	JE, SW	X	02S	05E	27	4	Y	Scio	Washtenaw
GHOW	GHOW-167-3-5	1	3/22/2005	JE, SW	X	02S	05E	34	4	Y	Scio	Washtenaw
GHOW	GHOW-167-3-6	1	3/22/2005	JE, SW	X	02S	05E	34	4	Y	Scio	Washtenaw
GHOW	GHOW-35-2-4	1	3/9/2005	JB	X	02S	10W	12	1	Y	Comstock	Kalamazoo
GHOW	GHOW-21-2-1	1	2/23/2005	JB	X	02S	15W	2	1	Y	Arlington	Van Buren
GHOW	GHOW-167-1-1	1	1/31/2005	MM, MS	X	03S	05E	21	3	Y	Lodi	Washtenaw
GHOW	GHOW-39-3-1	1	4/14/2005	BN	X	07S	13W	27	4	Y	Porter	Cass
GHOW	GHOW-39-1-1	1	1/26/2005	JB	X	07S	14W	5	2	Y	Calvin	Cass
GHOW	GHOW-39-2-1/2	2	3/9/2005	JB, BN	P	07S	14W	17	2	Y	Calvin	Cass
GHOW	GHOW-39-3-2	1	4/14/2005	JB	X	07S	14W	17	2	Y	Calvin	Cass
GHOW	GHOW-39-3-3	1	4/14/2005	JB	X	07S	14W	17	2	Y	Calvin	Cass
GHOW	GHOW-39-1-2	1	1/26/2005	JB	X	07S	14W	20	3	Y	Calvin	Cass
GHOW	GHOW-39-3-4	1	4/14/2005	JB	X	07S	14W	29	3	Y	Calvin	Cass
GHOW	GHOW-52-1-5	1	1/25/2005	MM, MS	X	08N	01E	9	2	Y	Fairfield	Shiawassee
GHOW	GHOW-52-1-6	1	1/25/2005	MM, MS	X	08N	01E	9	2	Y	Fairfield	Shiawassee
GHOW	GHOW-52-1-7	1	1/26/2005	MM, MS	X	08N	01E	12	1	Y	Fairfield	Shiawassee
GHOW	GHOW-52-1-4	1	1/25/2005	MM, MS	X	08N	01W	7	2	Y	Duplain	Clinton
GHOW	GHOW-52-1-8	1	1/26/2005	MM, MS	X	08N	02E	7	2	Y	Rush	Shiawassee
GHOW	GHOW-52-1-9	1	1/26/2005	MM, MS	X	08N	02E	8	2	Y	Rush	Shiawassee
GHOW	GHOW-52-1-10	1	1/26/2005	MM, MS	X	08N	02E	9	2	Y	Rush	Shiawassee
GHOW	GHOW-52-2-1	1	2/25/2005	MM, JE	X	08N	02W	9	2	Y	Greenbush	Clinton
GHOW	GHOW-52-1-2/3	2	1/25/2005	MM, MS	P	08N	02W	12	1	Y	Greenbush	Clinton
GHOW	GHOW-52-2-2	1	2/25/2005	MM, JE	X	08N	03W	11	1	Y	Essex	Clinton
GHOW	GHOW-52-1-1	1	1/25/2005	MM, MS	X	08N	03W	13	1	Y	Essex	Clinton
GHOW	GHOW-34-2-2	1	2/22/2005	MM, JE	X	08N	08W	8	2	Y	Otisco	Ionia

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
GHOW	GHOW-34-2-1	1	2/22/2005	MM, JE	X	08N	09W	3	1	Y	Grattan	Kent
GHOW	GHOW-34-1-1	1	1/27/2005	MM, MS	X	08N	09W	4	2	Y	Grattan	Kent
GHOW	GHOW-34-1-3/4	2	1/28/2005	MM, MS	P	08N	10W	1	1	Y	Cannon	Kent
GHOW	GHOW-34-1-5	1	1/28/2005	MM, MS	X	08N	10W	3	1	Y	Cannon	Kent
GHOW	GHOW-34-4-1	1	4/25/2005	JE, SW	X	08N	10W	5	2	Y	Cannon	Kent
GHOW	GHOW-34-3-1/2	2	3/24/2005	JE, SW	P	08N	11W	2	1	Y	Plainfield	Kent
GHOW	GHOW-34-1-2	1	1/27/2005	MM, MS	X	09N	10W	36	4	Y	Courtland	Kent
GHOW	GHOW-51-2-5	1	2/23/2005	MM, JE	X	10N	02W	3	1	Y	North Star	Gratiot
GHOW	GHOW-51-1-1	1	1/23/2005	MM, MS	X	10N	02W	23	4	Y	North Star	Gratiot
GHOW	GHOW-70-1-4	1	1/25/2005	MM, MS	X	10N	16E	3	1	Y	Lexington	Sanilac
GHOW	GHOW-70-1-6	1	1/25/2005	MM, MS	X	10N	16E	11	1	Y	Lexington	Sanilac
GHOW	GHOW-70-4-1	1	4/27/2005	JE, SW	X	10N	16E	12	1	Y	Lexington	Sanilac
GHOW	GHOW-70-1-7	1	1/25/2005	MM, MS	X	10N	16E	13	1	Y	Lexington	Sanilac
GHOW	GHOW-70-1-8	1	1/25/2005	MM, MS	X	10N	16E	23	4	Y	Lexington	Sanilac
GHOW	GHOW-70-1-9	1	1/25/2005	MM, MS	X	10N	16E	25	4	Y	Lexington	Sanilac
GHOW	GHOW-51-2-4	1	2/23/2005	MM, JE	X	11N	02W	23	4	Y	Emerson	Gratiot
GHOW	GHOW-70-4-2	1	4/27/2005	JE, SW	X	11N	16E	15	1	Y	Sanilac	Sanilac
GHOW	GHOW-70-1-3	1	1/25/2005	MM, MS	X	11N	16E	27	4	Y	Sanilac	Sanilac
GHOW	GHOW-70-1-5	1	1/25/2005	MM, MS	X	11N	16E	34	4	Y	Sanilac	Sanilac
GHOW	GHOW-51-2-3	1	2/22/2005	MM, JE	X	12N	02W	2	1	Y	Bethany	Gratiot
GHOW	GHOW-51-2-2	1	2/22/2005	MM, JE	X	12N	02W	10	1	Y	Bethany	Gratiot
GHOW	GHOW-51-1-2	1	1/23/2005	MM, MS	X	12N	02W	34	4	Y	Bethany	Gratiot
GHOW	GHOW-70-2-2	1	2/24/2005	MM, JE	X	12N	15E	2	1	Y	Bridgehampton	Sanilac
GHOW	GHOW-70-1-2	1	1/25/2005	MM, MS	X	12N	16E	35	4	Y	Sanilac	Sanilac
GHOW	GHOW-51-2-1	1	2/22/2005	MM, JE	X	13N	02W	23	4	N	Jasper	Midland
GHOW	GHOW-70-1-1	1	1/24/2005	MM, MS	X	13N	16E	31	3	Y	Forester	Sanilac
GHOW	GHOW-70-2-1	1	2/24/2005	MM, JE	X	13N	16E	31	3	Y	Forester	Sanilac
GHOW	GHOW-128-2-1	1	3/8/2005	DC, JE	X	20N	13W	1	1	N	Eden	Lake
GHOW	GHOW-128-3-1	1	4/2/2005	MS, JE	X	21N	12W	15	1	N	South Branch	Wexford
GHOW	GHOW-128-4-1	1	5/1/2005	BY, JE	X	21N	12W	21	3	N	South Branch	Wexford
GHOW	GHOW-128-3-2	1	4/2/2005	MS, JE	X	21N	12W	28	3	N	South Branch	Wexford
GHOW	GHOW-128-2-2	1	3/9/2005	DC, JE	X	22N	12W	11	1	N	Slagle	Wexford
GHOW	GHOW-128-4-2	1	5/2/2005	BY, JE	X	22N	12W	13	1	N	Slagle	Wexford
GHOW	GHOW-47-3-1/2	2	3/29/2005	MS, JE	P	26N	01E	2	1	Y	Big Creek	Oscoda

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
GHOW	GHOW-47-3-3	1	3/29/2005	MS, JE	X	27N	01E	12	1	Y	Greenwood	Oscoda
GHOW	GHOW-60-2-2	1	3/4/2005	DC, JE	X	27N	04E	13	1	Y	Comins	Oscoda
GHOW	GHOW-60-4-1	1	5/4/2005	BY, JE	X	27N	04E	13	1	Y	Comins	Oscoda
GHOW	GHOW-60-2-3	1	3/4/2005	DC, JE	X	27N	04E	23	4	N	Comins	Oscoda
GHOW	GHOW-47-3-4	1	3/29/2005	MS, JE	X	28N	02E	30	3	N	Elmer	Oscoda
GHOW	GHOW-60-3-1	1	3/31/2005	MS, JE	X	28N	05E	22	4	Y	Mitchell	Alcona
GHOW	GHOW-60-2-1	1	3/3/2005	DC, JE	X	28N	05E	27	4	Y	Mitchell	Alcona
GHOW	GHOW-59-4-4	1	5/5/2005	BY, JE	X	31N	05E	3	1	Y	Wellington	Alpena
GHOW	GHOW-59-3-1	1	3/29/2005	MS, JE	X	32N	05E	36	4	Y	Wellington	Alpena
GHOW	GHOW-59-4-3	1	5/4/2005	BY, JE	X	32N	06E	36	4	N	Long Rapids	Alpena
GHOW	GHOW-59-4-1	1	5/4/2005	BY, JE	X	32N	07E	15	1	Y	Maple Ridge	Alpena
GHOW	GHOW-59-3-3	1	3/30/2005	MS, JE	X	32N	07E	20	3	N	Maple Ridge	Alpena
GHOW	GHOW-59-3-4	1	3/30/2005	MS, JE	X	32N	07E	21	3	N	Maple Ridge	Alpena
GHOW	GHOW-59-4-2	1	5/4/2005	BY, JE	X	32N	07E	21	3	N	Maple Ridge	Alpena
GHOW	GHOW-59-3-5	1	3/30/2005	MS, JE	X	32N	07E	24	4	N	Maple Ridge	Alpena
GHOW	GHOW-59-3-2	1	3/30/2005	MS, JE	X	32N	07E	29	3	N	Maple Ridge	Alpena
GHOW	GHOW-42-2-3	1	3/5/2005	DC, JE	X	37N	05W	9	2	N	Center	Emmet
GHOW	GHOW-42-3-1	1	4/5/2005	JE, KB	X	38N	04W	25	4	N	Carp Lake	Emmet
GHOW	GHOW-42-2-1	1	3/4/2005	DC, JE	X	38N	05W	26	4	N	Bliss	Emmet
GHOW	GHOW-42-2-2	1	3/5/2005	DC, JE	X	38N	05W	33	3	N	Bliss	Emmet
GHOW	GHOW-9-2-2	1	3/13/2005	DC, JE	X	42N	23W	6	2	N	Maple Ridge	Delta
GHOW	GHOW-9-2-1	1	3/13/2005	DC, JE	X	42N	23W	8	2	N	Maple Ridge	Delta
GHOW	GHOW-9-4-3	1	5/10/2005	BY, JE	X	44N	23W	19	3	Y	Turin	Marquette
GHOW	GHOW-9-4-4	1	5/10/2005	BY, JE	X	44N	23W	21	3	Y	Turin	Marquette
GHOW	GHOW-9-2-4	1	3/13/2005	DC, JE	X	44N	23W	29	3	Y	Turin	Marquette
GHOW	GHOW-9-2-3	1	3/13/2005	DC, JE	X	44N	23W	30	3	Y	Turin	Marquette
GHOW	GHOW-9-4-2	1	5/10/2005	BY, JE	X	44N	23W	30	3	Y	Turin	Marquette
GHOW	GHOW-9-4-1	1	5/10/2005	BY, JE	X	44N	24W	36	4	N	Turin	Marquette
GHOW	GHOW-9-2-5	1	3/14/2005	DC, JE	X	45N	23W	34	4	N	Skandia	Marquette
GHOW	GHOW-24-4-4	1	5/7/2005	BY, JE	X	46N	10W	14	1	N	McMillan	Luce
GHOW	GHOW-24-4-1/2	2	5/6/2005	BY, JE	P	48N	08W	10	1	Y	McMillan	Luce
GHOW	GHOW-24-4-3	1	5/7/2005	BY, JE	X	48N	09W	23	4	N	McMillan	Luce
GHOW	GHOW-10-2-2	1	3/13/2005	DC, JE	X	48N	27W	9	2	Y	Ishpeming	Marquette
GHOW	GHOW-10-2-1	1	3/12/2005	DC, JE	X	48N	28W	1	1	N	Ely	Marquette

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
LEOW	LEOW-70-incidental	1	2/24/2005	MM, JE	#	12N	15E	14	1	Y	Bridgehampton	Sanilac
LEOW	LEOW-9-3-1	1	4/8/2005	JE, KB	X	44N	23W	20	3	Y	Turin	Marquette
LEOW	LEOW-10-3-1	1	4/10/2005	JE, KB	X	46N	28W	26	4	N	Ely	Marquette
LEOW	LEOW-10-3-2	1	4/10/2005	JE, KB	X	46N	28W	35	4	N	Ely	Marquette
LEOW	LEOW-14-4-1	1	5/9/2005	BY, JE	X	47N	17W	28	3	N	Munising	Alger
NSWO	NSWO-21-2-3	1	2/24/2005	JB	X	01N	15W	1	1	Y	Lee	Allegan
NSWO	NSWO-21-2-2	1	2/23/2005	JB	X	01N	15W	13	1	Y	Lee	Allegan
NSWO	NSWO-21-2-1	1	2/23/2005	JB	X	01N	15W	24	4	Y	Lee	Allegan
NSWO	NSWO-21-2-4	1	2/24/2005	JB	X	02N	15W	33	3	Y	Clyde	Allegan
NSWO	NSWO-39-2-1	1	3/10/2005	JB, BN	X	07S	14W	4	2	Y	Calvin	Cass
NSWO	NSWO-52-2-1	1	2/24/2005	MM, JE	X	08N	01W	11	1	Y	Duplain	Clinton
NSWO	NSWO-52-2-2	1	2/25/2005	MM, JE	X	08N	02W	12	1	Y	Greenbush	Clinton
NSWO	NSWO-34-1-1	1	1/28/2005	MM, MS	X	09N	10W	32	3	Y	Courtland	Kent
NSWO	NSWO-34-3-1	1	3/23/2005	JE, SW	X	09N	10W	36	4	Y	Courtland	Kent
NSWO	NSWO-70-2-1	1	2/23/2005	MM, JE	X	10N	16E	11	1	Y	Lexington	Sanilac
NSWO	NSWO-70-1-1	1	1/25/2005	MM, MS	X	11N	16E	11	1	Y	Sanilac	Sanilac
NSWO	NSWO-70-3-1	1	3/20/2005	JE, SW	X	12N	16E	26	4	Y	Sanilac	Sanilac
NSWO	NSWO-70-2-2	1	2/23/2005	MM, JE	X	12N	16E	34	4	Y	Sanilac	Sanilac
NSWO	NSWO-70-2-3	1	2/23/2005	MM, JE	X	13N	16E	33	3	Y	Forester	Sanilac
NSWO	NSWO-128-2-1	1	3/8/2005	DC, JE	X	21N	12W	28	3	N	South Branch	Wexford
NSWO	NSWO-128-3-1	1	4/2/2005	MS, JE	X	21N	12W	29	3	N	South Branch	Wexford
NSWO	NSWO-47-3-2	1	3/28/2005	MS, JE	X	25N	02E	5	2	Y	Big Creek	Oscoda
NSWO	NSWO-47-3-3	1	3/28/2005	MS, JE	X	25N	02E	5	2	Y	Big Creek	Oscoda
NSWO	NSWO-47-3-1	1	3/28/2005	MS, JE	X	25N	02E	8	2	Y	Big Creek	Oscoda
NSWO	NSWO-47-3-5	1	3/29/2005	MS, JE	X	26N	01E	2	1	Y	Big Creek	Oscoda
NSWO	NSWO-47-3-4	1	3/28/2005	MS, JE	X	26N	02E	31	3	Y	Big Creek	Oscoda
NSWO	NSWO-60-2-1	1	3/4/2005	DC, JE	X	27N	04E	1	1	Y	Comins	Oscoda
NSWO	NSWO-60-3-1	1	3/30/2005	MS, JE	X	27N	04E	1	1	Y	Comins	Oscoda
NSWO	NSWO-60-4-2	1	5/4/2005	BY, JE	X	27N	04E	1	1	Y	Comins	Oscoda
NSWO	NSWO-60-4-3	1	5/4/2005	BY, JE	X	27N	04E	23	4	N	Comins	Oscoda
NSWO	NSWO-60-4-1	1	5/3/2005	BY, JE	X	28N	05E	10	1	N	Mitchell	Alcona
NSWO	NSWO-60-3-2	1	3/30/2005	MS, JE	X	28N	05E	29	3	N	Mitchell	Alcona
NSWO	NSWO-59-2-1	1	3/2/2005	DC, JE	X	32N	07E	30	3	N	Maple Ridge	Alpena
NSWO	NSWO-9-3-1	1	4/8/2005	JE, KB	X	44N	23W	21	3	Y	Turin	Marquette

Table A-1. Continued.

Species[a]	Owl Observation ID	No. Obs.	Date	Observer (s)	Code	Town	Range	Section	Block	Priority	Twp. Name	County
NSWO	NSWO-9-4-1	1	5/10/2005	BY, JE	X	44N	23W	22	4	N	Turin	Marquette
NSWO	NSWO-10-3-1	1	4/10/2005	JE, KB	X	46N	28W	22	4	N	Ely	Marquette
NSWO	NSWO-24-4-2	1	5/7/2005	BY, JE	X	47N	09W	16	2	Y	McMillan	Luce
NSWO	NSWO-24-3-1	1	4/5/2005	JE, KB	X	47N	09W	30	3	N	McMillan	Luce
NSWO	NSWO-14-4-1	1	5/9/2005	BY, JE	X	47N	17W	33	3	N	Munising	Alger
NSWO	NSWO-24-4-1	1	5/7/2005	BY, JE	X	48N	09W	13	1	N	McMillan	Luce
NSWO	NSWO-24-3-3	1	4/6/2005	JE, KB	X	48N	09W	24	4	N	McMillan	Luce
NSWO	NSWO-24-3-2	1	4/6/2005	JE, KB	X	48N	09W	26	4	N	McMillan	Luce
NSWO	NSWO-23-4-1	1	5/8/2005	BY, JE	X	48N	14W	11	1	N	Burt	Alger
NSWO	NSWO-14-3-1	1	4/7/2005	JE, KB	X	48N	16W	32	3	N	Burt	Alger
NSWO	NSWO-10-4-2	1	5/11/2005	BY, JE	X	49N	28W	26	4	Y	Champion	Marquette
NSWO	NSWO-10-4-1	1	5/11/2005	BY, JE	X	49N	28W	35	4	Y	Champion	Marquette

[a] Species: BDOW = Barred Owl; EASO = Eastern Screech-Owl; GHOW = Great Horned Owl; LEOW = Long-eared Owl; and NSWO = Northern Saw-whet Owl.
[b] Observers: KB = Kim Borland; JB = John Brenneman; DC = David Cuthrell; JE = Jayson Egeler; MM = Michael Monfils; BN = Brian Nelson; BY = Brad Yocum; and SW = Sarah Warner.
[c] Breeding criteria codes: # = species observed in suitable nesting habitat during its breeding season; X = singing male present in suitable nesting habitat during its breeding season; P = pair observed in suitable nesting habitat during breeding season.
[d] Priority survey block: Y = yes and N = no.

Table A-2. Incidental species observation data by MBBA II survey block from owl surveys conducted in Michigan in 2005.

Species[a]	Point ID Number	No. Obs.	Date	Observer(s)[b]	Code[c]	Town	Range	Section	Block	Priority[d]	Twp. Name	County
AMBI	009-35	1	5/9/2005	BY, JE	X	43N	23W	17	2	Y	Maple Ridge	Delta
AMBI	023-12	1	5/7/2005	BY, JE	X	49N	12W	4	2	N	McMillan	Luce
AMCO	035-21	1	5/5/2005	JB	X	01S	10W	13	1	Y	Richland	Kalamazoo
AMRO	035-16	1	4/4/2005	BN	X	01S	10W	25	4	Y	Richland	Kalamazoo
AMRO	034-49	1	4/25/2005	JE, SW	X	09N	11W	32	3	Y	Algoma	Kent
AMRO	023-01	1	5/7/2005	BY, JE	X	49N	12W	1	1	N	McMillan	Luce
AMWO	021-15	1	5/4/2005	BN	X	01N	15W	12	1	Y	Lee	Allegan
AMWO	167-15	1	3/21/2005	JE, SW	X	01S	05E	10	1	Y	Webster	Washtenaw
AMWO	070-50	1	4/27/2005	JE, SW	X	10N	16E	24	4	Y	Lexington	Sanilac
AMWO	128-05	1	5/1/2005	BY, JE	C	20N	12W	6	2	N	Newkirk	Lake
AMWO	128-03	1	5/1/2005	BY, JE	C	20N	13W	12	1	N	Eden	Lake
AMWO	047-09	1	3/29/2005	MS, JE	X	28N	01E	25	4	N	Greenwood	Oscoda
AMWO	060-03	1	5/3/2005	BY, JE	X	29N	05E	13	1	N	Ossineke	Alpena
AMWO	060-05	1	5/3/2005	BY, JE	C	29N	05E	24	4	N	Ossineke	Alpena
AMWO	059-03	1	3/30/2005	MS, JE	X	32N	07E	13	1	Y	Maple Ridge	Alpena
AMWO	059-03	1	5/4/2005	MS, JE	C	32N	07E	13	1	Y	Maple Ridge	Alpena
AMWO	059-01	1	5/4/2005	BY, JE	C	32N	08E	19	3	N	Alpena	Alpena
AMWO	009-48	1	5/9/2005	BY, JE	X	42N	23W	6	2	N	Maple Ridge	Delta
AMWO	009-50	1	5/9/2005	BY, JE	C	42N	23W	7	2	N	Maple Ridge	Delta
AMWO	009-46	1	5/9/2005	BY, JE	X	43N	23W	32	3	N	Maple Ridge	Delta
AMWO	014-05	1	5/8/2005	BY, JE	X	46N	17W	27	4	Y	Munising	Alger
AMWO	023-05	1	5/7/2005	BY, JE	C	49N	12W	2	1	N	McMillan	Luce
CAGO	167-12	several	4/27/2005	JE, SW	X	01S	05E	8	2	Y	Webster	Washtenaw
CAGO	167-19	several	4/27/2005	JE, SW	X	01S	05E	21	3	Y	Webster	Washtenaw
CAGO	035-21	1	5/5/2005	JB	X	01S	10W	13	1	Y	Richland	Kalamazoo
CAGO	035-16	2	4/4/2005	BN	P	01S	10W	25	4	Y	Richland	Kalamazoo
CAGO	167-39	several	3/22/2005	JE, SW	#	03S	05E	16	2	Y	Lodi	Washtenaw
CAGO	039-25	2	3/14/2005	BN	P	07S	13W	30	3	Y	Porter	Cass
CAGO	022-01	2	4/8/2005	BN	P	07S	19W	8	2	Y	Weesaw	Berrien
CAGO	052-39	several	3/23/2005	JE, SW	#	08N	01E	12	1	Y	Fairfield	Shiawassee
CAGO	052-41	several	3/23/2005	JE, SW	#	08N	01E	12	1	Y	Fairfield	Shiawassee
CAGO	052-27	several	3/23/2005	JE, SW	#	08N	01W	10	1	Y	Duplain	Clinton
CAGO	052-29	several	3/23/2005	JE, SW	#	08N	01W	11	1	Y	Duplain	Clinton
CAGO	052-29	1	4/28/2005	JE, SW	X	08N	01W	11	1	Y	Duplain	Clinton

Table A-2. Continued.

Species[a]	Point ID Number	No. Obs.	Date	Observer(s)[b]	Code[c]	Town	Range	Section	Block	Priority[d]	Twp. Name	County
CAGO	052-25	several	3/23/2005	JE, SW	#	08N	01W	9	2	Y	Duplain	Clinton
CAGO	052-08	several	3/22/2005	JE, SW	#	08N	02W	7	2	Y	Greenbush	Clinton
CAGO	051-02	several	3/24/2005	JE, SW	#	09N	02W	11	1	Y	Washington	Gratiot
CAGO	051-10	several	3/24/2005	JE, SW	#	10N	02W	14	1	Y	North Star	Gratiot
CAGO	051-04	several	3/24/2005	JE, SW	#	10N	02W	35	4	Y	North Star	Gratiot
CAGO	051-08	several	3/24/2005	JE, SW	#	10N	02W	23	4	Y	North Star	Gratiot
CAGO	070-28	several	3/20/2005	JE, SW	#	11N	16E	10	1	Y	Sanilac	Sanilac
CAGO	070-15	several	3/20/2005	JE, SW	#	12N	16E	10	1	Y	Forester	Sanilac
CAGO	051-50	several	3/24/2005	JE, SW	#	13N	02W	12	1	Y	Jasper	Midland
CHSP	023-01	1	5/7/2005	BY, JE	X	49N	12W	1	1	N	McMillan	Luce
CHSP	023-45	1	5/8/2005	BY, JE	X	49N	14W	36	4	N	Burt	Alger
COLO	060-29	1	5/4/2005	BY, JE	X	28N	04E	36	4	Y	Clinton	Oscoda
COLO	014-43	2	5/9/2005	BY, JE	X	48N	16W	32	3	N	Burt	Alger
CORA	024-13	1	5/6/2005	BY, JE	X	48N	08W	10	1	Y	McMillan	Luce
EAME	051-02	1	3/24/2005	JE, SW	X	09N	02W	11	1	Y	Washington	Gratiot
FISP	035-21	1	5/5/2005	JB	X	01S	10W	13	1	Y	Richland	Kalamazoo
FISP	021-41	1	5/5/2005	JB	X	01S	15W	34	4	Y	Columbia	Van Buren
FISP	039-32	1	5/10/2005	JB	X	07S	14W	27	4	Y	Calvin	Cass
HETH	010-01	1	5/10/2005	BY, JE	X	45N	28W	2	1	N	Ely	Marquette
KILL	167-48	1	4/26/2005	JE, SW	X	04S	05E	3	1	Y	Saline	Washtenaw
KILL	167-50	1	4/26/2005	JE, SW	X	04S	05E	3	1	Y	Saline	Washtenaw
KILL	051-02	1	3/24/2005	JE, SW	X	09N	02W	11	1	Y	Washington	Gratiot
KILL	051-04	6	3/24/2005	JE, SW	X	10N	02W	35	4	Y	North Star	Gratiot
KILL	070-50	1	4/27/2005	JE, SW	X	10N	16E	24	4	Y	Lexington	Sanilac
KILL	051-25	1	3/24/2005	JE, SW	X	11N	02W	11	1	Y	Emerson	Gratiot
KILL	009-48	1	5/9/2005	BY, JE	X	42N	23W	6	2	N	Maple Ridge	Delta
KILL	023-07	1	5/7/2005	BY, JE	X	49N	12W	3	1	N	McMillan	Luce
MALL	014-05	1	5/8/2005	BY, JE	#	46N	17W	27	4	Y	Munising	Alger
MUSW	035-16	9	4/4/2005	BN	#	01S	10W	25	4	Y	Richland	Kalamazoo
MUSW	035-21	1	5/5/2005	JB	X	01S	10W	13	1	Y	Richland	Kalamazoo
RNPH	052-03	1	3/22/2005	JE, SW	X	08N	03W	11	1	Y	Essex	Clinton
RNPH	034-11	1	4/25/2005	JE, SW	X	08N	08W	5	2	Y	Otisco	Ionia
RUGR	010-18	1	4/10/2005	JE, KB	#	47N	27W	30	3	N	Tilden	Marquette
RWBL	051-02	1	3/24/2005	JE, SW	X	09N	02W	11	1	Y	Washington	Gratiot

Table A-2. Continued.

Species[a]	Point ID Number	No. Obs.	Date	Observer(s)[b]	Code[c]	Town	Range	Section	Block	Priority[d]	Twp. Name	County
SHCR	167-39	1	3/22/2005	JE, SW	X	03S	05E	16	2	Y	Lodi	Washtenaw
SHCR	023-05	1	5/7/2005	BY, JE	X	49N	12W	2	1	N	McMillan	Luce
SORA	035-21	1	5/5/2005	JB	X	01S	10W	13	1	Y	Richland	Kalamazoo
SORA	035-29	1	4/4/2005	BN	X	01S	10W	3	1	Y	Richland	Kalamazoo
SORA	059-46	1	5/5/2005	BY, JE	X	32N	04E	36	4	Y	Montmorency	Montmorency
SORA	059-03	1	5/4/2005	MS, JE	X	32N	07E	13	1	Y	Maple Ridge	Alpena
SWTH	024-01	1	5/6/2005	BY, JE	X	49N	07W	29	3	N	Whitefish	Chippewa
WTSP	042-04	1	5/5/2005	BY, JE	X	38N	03W	36	4	Y	Hebron	Cheboygan
WTSP	009-48	1	5/9/2005	BY, JE	X	42N	23W	6	2	N	Maple Ridge	Delta
WTSP	009-37	1	5/9/2005	BY, JE	X	43N	23W	21	3	N	Maple Ridge	Delta
WTSP	009-22	1	5/10/2005	BY, JE	X	44N	23W	20	3	Y	Turin	Marquette
WTSP	010-01	1	5/10/2005	BY, JE	X	45N	28W	2	1	N	Ely	Marquette
WTSP	014-14	1	5/8/2005	BY, JE	X	46N	17W	20	3	N	Munising	Alger
WTSP	014-25	1	5/9/2005	BY, JE	X	47N	17W	28	3	N	Munising	Alger
WTSP	023-07	1	5/7/2005	BY, JE	X	49N	12W	3	1	N	McMillan	Luce

[a] Species: AMBI = American Bittern; AMCO = American Coot; AMRO = American Robin; AMWO = American Woodcock; CAGO = Canada Goose; CHSP = Chipping Sparrow; COLO = Common Loon; CORA = Common Raven; EAME = Eastern Meadowlark; FISP = Field Sparrow; HETH = Hermit Thrush; KILL = Killdeer; MALL = Mallard; MUSW = Mute Swan; RNPH = Ring-necked Pheasant; RUGR = Ruffed Grouse; RWBL = Red-winged Blackbird; SHCR = Sandhill Crane; SORA = Sora; SWTH = Swainson's Thrush; and WISP = White-throated Sparrow.
[b] Observers: KB = Kim Borland; JB = John Brenneman; DC = David Cuthrell; JE = Jayson Egeler; MM = Michael Monfils; BN = Brian Nelson; BY = Brad Yocum; and SW = Sarah Warner.
[c] Breeding criteria codes: # = species observed in suitable nesting habitat during its breeding season; X = singing male present in suitable nesting habitat during its breeding season; P = pair observed in suitable nesting habitat during breeding season; and C = courtship behavior.
[d] Priority survey block: Y = yes and N = no.

APPENDIX B

Woodland Owl Survey Data Form

BBS Route Number:		Date:		Visit Number:		Time Period(s):	
Moon Phase:		County:		Surveyor(s):			

Station No.:	GPS Pt. Name:	Start Time:	Wind Speed: [ ]km/h [ ]mph [ ]Beaufort Index
Snow Cover: [ ]none [ ]patchy [ ]continuous / Approx. depth: [ ]cm [ ]in	Temp.: [ ]°F [ ]°C	Noise Level [ ]1 [ ]2 [ ]3 [ ]4	
Precip.: [ ]none [ ]light [ ]medium / [ ]snow [ ]rain	Cloud Cover (%):	Notes:	

SPECIES	2-MIN	BROADCAST PERIOD (shaded species UP only)							2-MIN	SEX	BEARING	ESTIMATED DISTANCE (km, circle one)
		N	B	E	L	B	G	G				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		S	O	A	E	D	G	H				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		W	O	S	O	O	O	O				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		O	W	O	W	W	W	W				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)

Comments:

Station No.:	GPS Pt. Name:	Start Time:	Wind Speed: [ ]km/h [ ]mph [ ]Beaufort Index
Snow Cover: [ ]none [ ]patchy [ ]continuous / Approx. depth: [ ]cm [ ]in	Temp.: [ ]°F [ ]°C	Noise Level [ ]1 [ ]2 [ ]3 [ ]4	
Precip.: [ ]none [ ]light [ ]medium / [ ]snow [ ]rain	Cloud Cover (%):	Notes:	

SPECIES	2-MIN	BROADCAST PERIOD (shaded species UP only)							2-MIN	SEX	BEARING	ESTIMATED DISTANCE (km, circle one)
		N	B	E	L	B	G	G				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		S	O	A	E	D	G	H				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		W	O	S	O	O	O	O				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		O	W	O	W	W	W	W				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)

Comments:

Station No.:	GPS Pt. Name:	Start Time:	Wind Speed: [ ]km/h [ ]mph [ ]Beaufort Index
Snow Cover: [ ]none [ ]patchy [ ]continuous / Approx. depth: [ ]cm [ ]in	Temp.: [ ]°F [ ]°C	Noise Level [ ]1 [ ]2 [ ]3 [ ]4	
Precip.: [ ]none [ ]light [ ]medium / [ ]snow [ ]rain	Cloud Cover (%):	Notes:	

SPECIES	2-MIN	BROADCAST PERIOD (shaded species UP only)							2-MIN	SEX	BEARING	ESTIMATED DISTANCE (km, circle one)
		N	B	E	L	B	G	G				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		S	O	A	E	D	G	H				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		W	O	S	O	O	O	O				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		O	W	O	W	W	W	W				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)

Comments:

Station No.:	GPS Pt. Name:	Start Time:	Wind Speed: [ ]km/h [ ]mph [ ]Beaufort Index
Snow Cover: [ ]none [ ]patchy [ ]continuous / Approx. depth: [ ]cm [ ]in	Temp.: [ ]°F [ ]°C	Noise Level [ ]1 [ ]2 [ ]3 [ ]4	
Precip.: [ ]none [ ]light [ ]medium / [ ]snow [ ]rain	Cloud Cover (%):	Notes:	

SPECIES	2-MIN	BROADCAST PERIOD (shaded species UP only)							2-MIN	SEX	BEARING	ESTIMATED DISTANCE (km, circle one)
		N	B	E	L	B	G	G				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		S	O	A	E	D	G	H				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		W	O	S	O	O	O	O				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)
		O	W	O	W	W	W	W				(<.1) (.1-.25) (.25-.5) (.5-.75) (.75-1) (>1)

Comments: