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### EFFECTS OF TIME OF DAY ON NUMBERS AND ACTIVITY OF FALL MIGRANT AND WINTERING RED-TAILED HAWKS IN EASTERN KANSAS

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**Abstract.** We conducted 47 roadside counts of Red-tailed Hawks (*Buteo jamaicensis*) to determine the best time of day to conduct counts. The day was divided into four periods: early morning, late morning, early afternoon, and late afternoon. We found no differences in time of day and numbers of hawks counted and number of hawks seen perched. However, there was a difference in time of day and number of hawks flying. Counts of Red-tailed Hawks taken during any time of day can provide good indices of relative abundance. However, observers must be aware of visibility biases caused by missing flying hawks and hawks perched in forested landscapes.

#### INTRODUCTION

Raptorial birds are near the top of the food chain and are readily affected by environmental contaminants (Hickey and Anderson 1968; Havera and Duzan 1986). Because biochemical activity of substances can affect raptor reproductive rates and population dynamics (Henny 1972; Sibly et al. 2000), raptors can be useful sentinel species for protecting ecological systems in risk assessment.

Season and time of day influence the activity and thus the detection of birds for counting (Fuller and Mosher 1987; Skirvin 1981; Best 1981). Generally, mornings are considered better for obtaining counts of raptors than afternoons (Bunn et al. 1995; Robbins 1981).

Time of day can influence raptor species in different ways. Red-tailed Hawks (*Buteo jamaicensis*) are more likely to be flying than perching during afternoons because of greater availability of thermal updrafts (Bildstein 1987; Bunn et al. 1985; Diesel 1984). We examined time of day influences on count numbers and perching vs. flying behavior in migrant and wintering Red-tailed Hawks counted on roadside surveys in eastern Kansas.

#### METHODS

We conducted roadside counts of Red-tailed Hawks from 15 September 2000 through 15 March 2001 along seven routes through portions of 17 counties in eastern Kansas. We drove routes at prevailing speed limits, typically 88-113 km/hr. Red-tailed Hawks were counted during four time-periods: early morning (0700-1000 CDT), late morning (1001-1200 CDT), early afternoon (1201-1529 CDT), and late afternoon (1530-1730 CDT). Hawks were recorded as either perched or flying. All counts were conducted on days when skies were clear and winds were less than 16 km/hr.

Using SPSS Curvefit software (SPSS Inc., Chicago, IL), we tested three alternative

hypotheses:

$H_{01}$  = there is no difference between time of day and number of Red-tailed Hawks counted

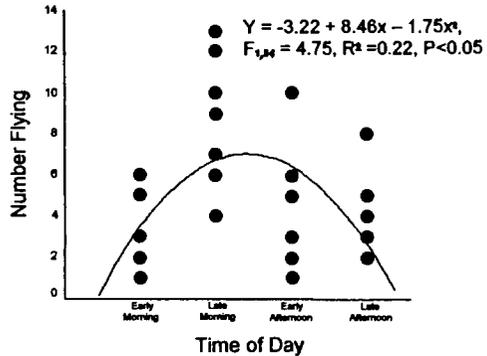
$H_{02}$  = there is no difference between time of day and number of Red-tailed Hawks flying

$H_{03}$  = there is no difference between time of day and number of Red-tailed Hawks perched

We used ANOVA to test these hypotheses and  $P < 0.05$  as the level of significance in all tests.

## RESULTS

We completed 47 counts and counted 1,196 Red-tailed Hawks (1,007 perched, 189 flying). The first hypothesis of no difference between count and time of day was accepted ( $F_{1,45} = 0.58$ ,  $R^2 = 0.01$ ,  $P > 0.40$ ), as was the third hypothesis that there was no difference in number of hawks perched and time of day ( $F_{1,45} = 0.55$ ,  $R^2 = 0.01$ ,  $P > 0.40$ ). However, we rejected the hypothesis that there was no difference between time of day and number of hawks flying (Fig. 1).



## DISCUSSION

Unlike previous researchers (Bildstein 1987; Bunn et al. 1995; Diesel 1984) we did not find a difference in number of Red-tailed Hawks counted during the four time periods. We did, however, find that more hawks tended to be flying during the late morning to afternoon period than earlier in the day.

Our results indicate that counts of Red-tailed Hawks taken any time during the day would provide good indices of relative abundance. We would suggest that researchers examine the visibility of redtails relative to roadsides and particularly compare the visibility of flying vs. perched raptors. It is likely that more flying hawks are missed from a moving car than those that are perched and in heavily forested landscapes it is likely that many perched birds are missed. Counts conducted during periods when foliage is present on trees will also bias counts of perched raptors. During five years of roadside counts of raptors (unpublished data) we have found that counts along more forested routes are often lower than those on routes predominantly in open country.

**Figure 1.** — Influence of time of day on fall and winter roadside counts of Red-tailed Hawks, 2000-2001. Time periods are: early morning (0700-1000 CDT), late morning (1001-1200 CDT), early afternoon (1201-1529 CDT), and late afternoon (1530-1730 CDT).

## ACKNOWLEDGEMENTS

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## 2002 REPORT OF THE KANSAS BIRD RECORDS COMMITTEE

This report summarizes the activities of the Committee for the calendar year 2002, as well as any decisions pending from previous years. The Committee received 46 observation reports in 2002, recording the occurrence of 44 different birds. Of this total, 35 records were circulated. All reports submitted, whether circulated to the committee or not, are archived in the Natural History Museum at the University of Kansas.

Record submissions are assigned a sequential number in the order in which they are received, with the year of receipt as a prefix. Not all submissions that receive a number are circulated. Birds are listed in phylogenetic order under each of two categories: Records Accepted and Records Not Accepted. Taxonomy and nomenclature follow the American Ornithologists' Union *Check-list of North American Birds* (Seventh edition, 1998) and all updates.

After the English and scientific name follows the KBRC record number; the number of individuals seen, with age or plumage notes; date(s) of observation; locality, including county; observer(s), with those documenting the record listed first; supporting physical evidence, if any, received by the Committee; and finally, comments and notes on changes in the species' status on the KOS checklist. Records that were not accepted by the committee have the observers' names omitted, and a brief explanation of the reasoning behind that decision.

### RECORDS ACCEPTED

- Red-throated Loon (*Gavia stellata*), 2002-34, 1, unknown sex/unknown age, 29 Nov. 2002, Winfield City Lake (Cowley Co.), reported by Kevin Groeneweg, other observers included Duane DeLong, Max Thompson, & Gene Young. Documented with 2 photos.
- Pacific Loon (*Gavia pacifica*), 2002-40, 1, unknown sex/unknown age, 10 Nov. 2002, Meade State Lake (Meade Co.), reported by Sebastian Patti, other observer - Chris Hobbs.
- Yellow-billed Loon (*Gavia adamsii*), 2002-32, 1 unknown/unknown age, 10 Nov. 2002, Clark County State Lake (Clark Co.), reported by Sebastian Patti/Chris Hobbs. Documented with 1 drawing. The bird remained on this lake for several weeks, allowing additional reports to be submitted by Bill & Nancy Beard (KBRC #2002-32A, 11 Nov 2002) and Kevin Groeneweg (KBRC #2002-32B, 16

- Nov 2002). Additional observers reported by these individuals included Duane DeLong, Carolyn Schwab, Cheryl Miller, Scott Seltman, & Henry Armknecht. Both of the latter reports also included photographs (video frame captures) of the bird, allowing the KBRC to **remove this species from the hypothetical list.**
- Brown Pelican (*Pelecanus occidentalis*), 2002-15, 1 immature/sex unknown, 23 Apr 2002, north shore boat ramp, Kirwin Reservoir (Phillips Co.), reported by Shannon Rothchild, other observer - Deon Steinle. Documentation submitted with this report included 3 photos.
- Brown Pelican (*Pelecanus occidentalis*), 2002-19, 1 immature/sex unknown, 16 Jun 2002, east shore of Cheney Res. (Sedgwick Co.), reported by Pete Janzen, other observers included Don Vannoy, Fran Vannoy, Kevin Groeneweg, & Laura Groeneweg.
- Brown Pelican (*Pelecanus occidentalis*), 2002-37, 1 immature/unknown sex, 27 Oct 2002, spillway at Marion County reservoir (Marion Co.), reported by Matt Gearheart, other observers included Mike Gearheart & Will Chatfield-Taylor.
- Anhinga (*Anhinga anhinga*), 2002-21, 1 adult male, 23 Jun 2002, Unit B, Marais des Cygnes Wildlife Management Area (Linn Co.), reported by David Seibel, other observers included Mick McHugh & Galen Pittman.
- Glossy Ibis (*Plegadis falcinellus*), 2002-18, 1 adult alternate plumage/unknown sex, 17 May 2002, 1.3 mi. N of Unit 49 gate, Quivira NWR (Stafford Co.), reported by M.K. Edge Wade, other observers included Janice Glaston, Susan Hazelwood, & Bonnie Heidy.
- Gyr Falcon (*Falco rusticolus*), 2002-38, 1 unknown age/unknown sex, 09 Nov 2002, west end of Melvern Lake (Osage Co.), reported by Bob Fisher, other observers included Jane Leonatti, Gary Johnson, & Helen Hewins.
- Sandhill Crane (*Grus canadensis*), 2002-42, flock of 200, 21 Dec 2002, Manhattan airport area (Riley Co.), reported by Peter Oviatt. Reports in eastern Kansas, especially northeast, are very unusual during winter.
- Mountain Plover (*Charadrius montanus*), 2002-29, 1 adult/unknown sex, 02 Sep 2002, pool 4A at Cheyenne Bottoms (Barton Co.), reported by Jackie Nooker. Documentation received with this report included 13 photos.
- White-rumped Sandpiper (*Calidris fuscicollis*), 2002-25, 1 adult alternate plumage/unknown sex, 12 Jul 2002, Quivira NWR (Stafford Co.), reported by Mark Robbins, other observers included Dan Kluza & Max Thompson. Documentation received with this report included 2 photos. Fall migration records for this species in KS are very rare. These birds have an elliptical migration pattern; spring migrants come through the interior US and fall migrants move along the east coast.
- Curlew Sandpiper (*Calidris ferruginea*), 2002-24, 1 adult male, 12 Jul 2002, Quivira NWR (Stafford Co.), reported by Mark Robbins, other observers included Dan Kluza & Max Thompson. Documentation received with this report included 1 photo. **Seventh state record.** Most records from the interior US are from fall migration (July-Aug).
- Gull-billed Tern (*Sterna nilotica*), 2002-27, 1 first basic plumage/unknown sex, 21 Sep 2002, Liberal Sewage Pond (Seward Co.), reported by Gregg Friesen, other observers included Rod Wedel, Kemper Straley. **Second state record** for this rare migrant to the interior US.
- White-winged Dove (*Zenaida asiatica*), 2002-14, 1 adult basic plumage/unknown sex, 06 May 2002, residential backyard, Pittsburg (Crawford Co.), reported by Robert Mangile, other observer - Elizabeth Mangile.
- White-winged Dove (*Zenaida asiatica*), 2002-20, 1 unknown age/unknown sex, 09 May 2002, rural yard (Pratt Co.), reported by Linda Loomis. Documentation received with this report included 4 photos.
- Inca Dove (*Columbina inca*), 2002-8, 1 unknown age/unknown sex, from late November 2002 through 15 Apr 2002, backyard, Garden Plain (Sedgwick Co.), reported by Dean & Aimee Wallace, other observer - David Hall.
- Inca Dove (*Columbina inca*), 2002-12, 1 adult basic plumage/unknown sex, 31 Mar 2002, residential backyard, McPherson (McPherson Co.), reported by Rich Duerksen, other observer - Deanna Duerksen.

- Common Ground-dove (*Columbina passerina*), 2002-1, 1 adult basic plumage/unknown sex, 2 Jan 2002 through March 2002, urban backyard, Olathe (Johnson Co.), reported by Mark Corder, other observers included Elaine Corder, Mick McHugh, Chris Hobbs, Sebastian Patti, Galen Pittman, & many other observers. Documentation received with this report included digital video.
- Common Ground-Dove (*Columbina passerina*), 2002-28, 1 first basic plumage/unknown sex, 08 Oct 2002, yard of 9228 Shade Avenue (Sedgwick Co.), reported by Dan Kilby, other observers included Ruth Goodrick, Rick Goodrick, Don Vannoy, Fran Vannoy, & Sandra Tholen.
- Rufous Hummingbird (*Selasphorus rufus*), 2002-33, 1 HY male, 28 Nov 2002, suburban backyard (Johnson Co.), reported by Troy Gordon, other observers included Janine Gordon & Nancy Leo. The bird was trapped, measured, banded and released. Documentation received with this report included 4 photos.
- Lewis' Woodpecker (*Melanerpes lewis*), 2002-36, 1 unknown age/unknown sex, 12 Oct 2002, Clinton State Park (Douglas Co.), reported by Gerry Parkinson, other observer - Wakefield Dort. **Eleventh state record.**
- Lewis' Woodpecker (*Melanerpes lewis*), 2002-44, 1 unknown age /unknown sex, 10 Nov 2002, cemetery, Liberal (Seward Co.), reported by Sebastian Patti & Chris Hobbs. **Twelfth state record.**
- Red-naped Sapsucker (*Sphyrapicus nuchalis*), 2002-6, 1 adult basic-plumaged male, 17 Mar 2002, Suicide Bluff, Scott State Park (Scott Co.), reported by Tom Shane, other observer - Sara Shane. **Seventh state record.**
- Red-naped Sapsucker (*Sphyrapicus nuchalis*), 2002-35, 1 adult female, 23 Sep 2002, next to the cemetery in Elkhart (Morton Co.), reported by Mick McHugh, other observer - Galen Pittman. **Eighth state record.**
- Ash-throated Flycatcher (*Myiarchus cinerascens*), 2002-22, 1 unknown age/unknown sex, 14 Aug 2002, Big Spring and Pond, Scott State Park (Scott Co.), reported by Tom Shane, other observer - Sara Shane. Documentation received with this report included 1 sketch.
- Cassin's Vireo (*Vireo cassini*), 2002-31, 1 basic plumage/unknown sex, 22 Sep 2002, north fork of Cimarron River (Morton Co.), reported by Mick McHugh, other observers included Galen Pittman & Mark Corder.
- Fish Crow (*Corvus ossifragus*), 2002-3, 1 adult basic plumage/unknown sex, 03 Feb 2002, tributary of Mud Creek, NE Douglas County (Douglas Co.), reported by Mark Robbins. This is a very early seasonal record for this species, which normally arrives in Kansas and neighboring states in March or April. It appears that the species continues to expand its range in Kansas and elsewhere. **Tenth state record.**
- Orange-crowned Warbler (*Vermivora celata*), 2002-7, 1 basic plumage/unknown sex, early February through mid-March 2002, suburban backyard, visiting a suet feeder (Pottawatomie Co.), reported by Kimberly With, other observer - Greg Schrock. This species typically spends the winter well to the south of Kansas.
- Golden-crowned Sparrow (*Zonotrichia atricapilla*), 2002-11, 1 immature (first-winter plumage)/unknown sex, 9 Mar 2002, brush along a gravel road (Linn Co.), reported by Mick McHugh.
- Dickcissel (*Spiza americana*), 2002-2, 1 adult male (basic plumage), 5 Jan through 10 Jan 2002, urban backyard, Wichita (Sedgwick Co.), reported by Margaret Clemence, other observers included Don Clemence, Virgil Stukey, Thelma Stukey, Dean Palmer & Diana Palmer. Documentation submitted with this report included 3 photos. While this species is a common summer resident in Kansas, most winter in South America.
- Brambling (*Fringilla montifringilla*), 2002-4, 1 adult male, molting into alternate plumage, 22 Jan 2002 and 15 Mar 2002, rural backyard NW of Linn (Washington Co.), reported by Warren Buss. Documentation submitted with this report included digital videos (taken on two separate occasions). **First state record, added to the state checklist.**
- White-winged Crossbill (*Loxia leucoptera*), 2002-23, 1 basic-plumaged female, 16 Apr 2002, residential backyard, Garden City (Finney Co.), reported by Tom Shane,

other observers included Sara Shane. Documentation submitted included 2 photos.

#### RECORDS NOT ACCEPTED

Iceland Gull (*Larus glaucooides*), 2002-5, 1 immature basic plumage/unknown sex, 23 Feb 2002, outlet area of John Redmond Reservoir (Coffey Co.). Identification of immature gulls in this species complex is difficult, and the description provided did not provide enough detail to rule out other possible identifications.

Rufous Hummingbird (*Selasphorus rufus*), 2002-41, 1 unknown age/female from 8 Sep 2001 through 13 Sep 2001, backyard in Wichita (Sedgwick Co.). The description provided for this report did not have enough detail to rule out the possibility of other *Selasphorus* species.

*Members of the committee voting on these records*—Greg Farley, Bob Gress (Alternate), Mick McHugh, Lloyd Moore, Mike Rader, David Rintoul (Secretary), Carolyn Schwab (Alternate), Max Thompson (Chair), Eugene Young.

Submitted by David A. Rintoul, KBRC Secretary, May 2002.

### PROBABLE SUCCESSION RELATED PREY CHANGES OF LONG-EARED OWLS IN KANSAS

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Pellet collections of the Long-eared Owl (*Asio otus*) were made from winter roosts of groups of owls in the years 1951 and 2003 at the Fitch Natural History Reservation (FNHR) in northeast Kansas. The roosts were about 1/3 mi (0.53 km) apart. In 1951, about a dozen owls roosted in thick woods on a slope northwest of the south end of "Quarry Field", a flat, triangular hilltop pasture. In 2003, a group believed to consist of only three owls, used four roosts in red cedars, *Juniperus virginiana*, on the Rockefeller Experimental Tract about 100 m NNW of the area's entrance gate (north across the county road from Quarry Field (in Jefferson County)).

The foraging areas of the 1951 and 2003 owl aggregations undoubtedly overlapped widely. However, ecological succession had wrought drastic changes in this 52-year interval. In the years before 1949 Quarry Field had been a much overgrazed and nearly barren pasture, but by 1951, with livestock removed, it had a thick grassweed ground cover, and by 2003 many small to medium-sized trees of more than a dozen species covered most of the area. In 1951 the area of the 2003 roosts was treeless and was part of a cultivated field, then privately owned. However, by 2003 this area, which was at the head of a gully, had grown up to a thicket of many tree species, but it adjoined open grassland on the mowed strip and the grazed strip of the Rockefeller Experimental Tract.

In the analysis of the pellet counts, thousands of limb bones were identified, but to define numbers of individual prey animals only the skulls were used. Usually the owl crushed the back of the cranium in killing its prey, but the anterior part, together with the rostrum and mandibles, were ordinarily not damaged. From the 1951 collection, Robert L. Packard, then a graduate student, identified 65 prey items, and we identified 53 others. Packard's material was not only identified to species but every individual was tentatively aged, usually to the nearest month, by comparison with known-age specimens. The 2003 sample was identified from a FNHR reference collection.

Typical pellets were about 75 mm long and 18 mm in diameter, but they varied from 12 mm to more than 100 mm in length. When they were collected most were

placed together in plastic bags without individual wrapping. Even though they were carefully handled, many were found to have broken apart when they were removed, hence the number of pellets examined and the number of prey animals per pellet cannot be stated with certainty. For animals the size of the prairie vole (up to 50 g) there was usually only one skeleton, or part of it, per pellet, whereas least shrews and harvest mice, sometimes weighing only one-tenth as much, were often found in combinations of two or three individuals per pellet.

Our data suggests changes caused by season and by ecological succession. Individual owls were not recognized, but, assuming that each returned to its own roost tree regularly, we might have been able to show differences in individual preferences as well as seasonal changes. In the following lists prey animals are recorded in order of frequency, and the percentage of the sample for each is shown in parentheses. For the 2003 sample there were 422 animals: 240 prairie voles (*Microtus ochrogaster*, 56.9%), 108 western harvest mice (*Reithrodontomys megalotis*, 25.6%), 45 white-footed mice (*Peromyscus leucopus*, 10.7%), 19 least shrews (*Cryptotis parva*, 4.5%), 6 hispid cotton rats (*Sigmodon hispidus*, 1.4%), 2 southern bog lemmings (*Synaptomys cooperi*, 0.5%) and 2 passerine birds (0.5%).

In contrast, the 1951 sample of 118 animals contained 29 deer mice (*Peromyscus maniculatus*, 24.6%), 25 western harvest mice (21.2%), 24 prairie voles (20.3%), 13 hispid cotton rats (11.0%), 6 least shrews (5.1%), 5 short-tailed shrews (*Blarina hylophaga*, 4.2%), 5 woodland voles (*Microtus pinetorum*, 4.2%), 4 Great Plains harvest mice (*Reithrodontomys montanus*, 3.4%), 3 house mice (*Mus musculus*, 2.5%), 2 white-footed mice (*Peromyscus leucopus*, 1.7%), and 2 passerine birds (1.7%). One of the most striking changes was the elimination of the shortgrass species, the deer mouse and the Great Plains harvest mouse, as their habitat disappeared. A collection of pellets from the same general time period in western Douglas County showed a similar species composition but with different frequencies of occurrence, and no indication of foraging habitat (Rainey and Robinson. 1954. Trans. Kansas Acad. Sci. 57: 206-207).

Seasonal changes were evident in the 12 (13.4%) occurrences of the least shrew in the January 2003 sample, dwindling to 2.4% in February and none in March. It was surprising that the short-tailed shrew was represented only in 1951. As a woodland species it might have been expected to increase with the spread of forest during succession.

Little is known of the extent of the owls' movements. On a relatively warm and still evening in January, 1951 the aggregation of owls from the roost was observed circling over the south end of Quarry Field in what seemed to be pre-hunting maneuvers. In the 16 March 2003 pellet collection we found a metal ear tag for small mammals that had been used to identify a female white-footed mouse on 12 June 2002. The animal had been tagged on the University of Kansas' Biotic Succession Area, approximately 0.6 mi (0.97 km) from the roost where the pellet was found. The mouse was caught three times in June 2002, twice in September, and three times in December, all at approximately the same place. The grassland area adjoining the roost was separated by an area of about 0.53km of forest and scrub that seemed unsuitable for the owls' hunting or as habitat for its prey. Presumably the owl that ate the tagged animal traversed this wooded area to hunt on the Biotic Succession Area where rodents were abundant, and crossed it again to return to its roost.

We are indebted to Robert H. Hagen for information regarding his use of the ear tag.

## AVIAN POX IN A KANSAS SONG SPARROW

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Avian pox is the common name for a disease of birds caused by a large virus in the avipoxvirus group of pox viruses. There are several similar strains in the group; some with the ability to infect several species of birds, while others appear species-specific. The disease is transmitted by mosquito vectors or direct contact of abraded skin with surfaces bearing the virus. Approximately 60 free-living bird species in 20 families have been reported with avian pox, including the Dark-eyed Junco (*Junco hyemalis*), Chipping Sparrow (*Spizella passerina*), Field Sparrow (*Spizella pusilla*), and the Song Sparrow (*Melospiza melodia*) among the Emberizidae (McFerran, J. B. and S. M. McNulty. eds. 1993. *Virus Infections of Birds*. Elsevier Science Publ., Amsterdam). Despite its worldwide occurrence, importance in the decline of some bird populations, and occurrence in additional bird species in recent years (suggesting an emerging viral disease), little is known about its prevalence in wild bird populations (Freud, M. and J. C. Franson, eds. 1999. *Field manual of wildlife diseases*. U. S. Dept. Interior, U. S. Geol. Sur., Washington, D. C.).

On 1 April 1995, I captured and banded a Song Sparrow in the Baker Wetlands Natural Area on the south edge of Lawrence, Douglas Co., Kansas. The most common form of avian pox, large warty nodules on featherless parts of the anatomy, was clearly evident on the right foot. The surface tissue of several toes had died and was crusty and brittle. The inside toe, normally 7mm in length was now only 3 mm due to breaking off. The hallux had produced an abnormally long (12 mm vs. the average 7 mm) nail, which had also become twisted as it grew (Fig. 1). The bird was otherwise in apparent good health. Its weight (21.8 g vs. 21.6 g average for 12 others captured that week) and fat score (3.0 vs. 2.8 average) suggested that it was not in any obvious distress.



**Figure 1.** — Photograph of Song Sparrow foot with avian pox. Warty nodules are clustered on the toes at the base of the tarsus. Note the elongated twisted nail on hallux (hind toe).

I had never seen other individuals of this species with avian pox in the 20 years of banding Song Sparrows prior to this capture. I have not seen it in the subsequent eight years. While the banding effort varies from year to year, the number of Song Sparrows banded over this period is 1260 individuals (average 45/yr). The frequency of pox among them is consequently only 0.08%. This low number undoubtedly reflects the fact that the majority of Song Sparrows in the Wetlands are low density migrants or winter visitants, with little opportunity for the spread of the disease. Observations by birders at winter feeding stations where this species is a frequent visitor might provide additional useful data on the spread of the disease in concentrated populations of birds.

I thank Roger Boyd for his helpful review of the manuscript.