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THE IRRUPTIVE MOVEMENT OF SNOWY OWLS (*Bubo scandiacus*) INTO KANSAS AND MISSOURI DURING THE WINTER OF 2011-2012

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Abstract – Unprecedented documentation of a major Snowy Owl (*Bubo scandiacus*) irruption during the winter of 2011-2012 resulted in a minimum of 154 and 67 reports in Kansas and Missouri, respectively. Of the 125 reports where age could be determined, 82% were hatching year birds, whereas 18% were at least a year old. Of 24 birds that were salvaged, all but three were very emaciated.

INTRODUCTION

During the late fall and winter of 2011-2012 a major irruption of Snowy Owls (*Bubo scandiacus*) occurred into the interior of North America that reached as far south as north-central Texas (Lockwood *et al.* 2012). Unlike prior major irruptions (LaSelle 1975, Parmelee 1992, Thompson *et al.* 2011), the internet and cell phones allowed for immediate communication and unprecedented documentation of this event. At the very outset of this movement observers in Kansas and Missouri were encouraged to photograph birds, especially of the dorsal surface, to enable ageing and sexing of individuals. We present the results of that event herein.

METHODS

From the third week of November 2011, via listserves and press releases, we encouraged observers in Kansas and Missouri to photograph owls, especially the dorsal surface. We received a number of reports that proved to be other bird species, e.g., Red-tailed Hawks and Barred Owls, so we were cautious when reviewing reports, especially those that involved only sight observations. In assessing the uniqueness of each report when there were multiple reports within the same area, we considered observations to be of a single individual if photographs indicated only one bird and reports were within a ca. 2 km (1.2 mile) radius. However, there were a number of instances where multiple owls were present at the same locality and date, e.g., three perched on the same irrigation unit near Fortescue, Holt County, Missouri, five at

Smithville Lake, Clay County, Missouri, four at Cheyenne Bottoms, Barton County, Kansas. At the end of the winter season the authors reviewed photographs using Pyle (1997, 1998), Seidensticker *et al.* (2011), and specimens deposited at the University of Kansas Biodiversity Institute as references for ageing and sexing. In addition, Peter Pyle and Paul Kerlinger reviewed photographs for their opinions on the age-sex of a few selected owls.

RESULTS AND DISCUSSION

There were a minimum of 154 Kansas and 67 Missouri reports (Figure 1, 2). The initial observations occurred 15 and 21 November (both from Dickinson Co., KS), with a minimum of 84 reports (54 KS, 30 MO) by the end of

December. The last individuals were seen: 7 March (Barton Co., KS; R. Penner), 8 March (Jasper Co., MO; J. Cantrell, J. Thomas), and 6 April (Mitchell Co., KS; T. Marlier). Besides the obvious expected historical pattern that more birds would be recorded in the northern

tiers of both states (Robbins and Easterla 1992, Thompson *et al.* 2011), the majority of observations were in the central

and eastern part of Kansas and western Missouri (Figure 1,2). Despite the obvious bias in Kansas, where there are more people in the eastern third of the state, no such bias occurs in Missouri. Moreover, ebird data (ebird.org) for the interior of North America during the November through February, 2011-2012 period further supports that the distribution of the observations indicated in Figure 1 and 2 accurately reflects the frequency and distribution of this historic event.

Of individuals that could be categorized to age-sex class, 39 were hatching year (HY) males and 63 HY females. Because of plumage similarity between older females (> 1 year old; ASY) and younger (> 1 year, < 3-4 years old) males (Pyle 1997, 1998), 23 birds that were documented with photographs and/or descriptions that lacked sufficient detail were considered to be either older females or ASY males. There

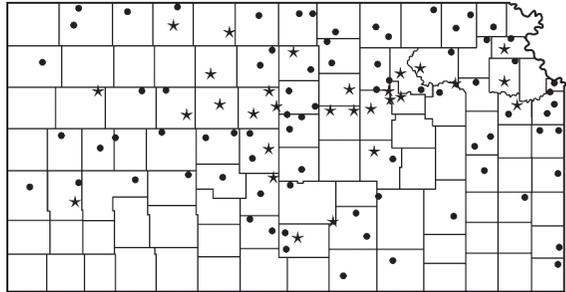


Figure 1. Distribution of Snowy Owl reports in Kansas during winter 2011-2012. Circle indicates single record; star indicates multiple individuals/locality.

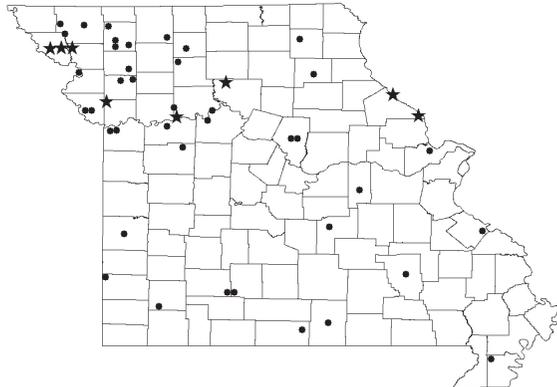


Figure 2. Distribution of Snowy Owl reports in Missouri during winter 2011-2012. Circle indicates single record; star indicates multiple individuals/locality.

were 96 reports of individuals that could not be categorized to any age-sex class. Based on determinations of photographs by Pyle and Kerlinger there were a minimum of 4 ASY females. Pyle identified 2 of 5 birds that were extensively photographed at Smithville Lake, Clay County, Missouri, as females that were at least 4 and 6 years of age. Another female that was found dead and photographed, but not preserved, in Sumner County, Kansas, was at least 4 years old (Pyle, pers. comm.), and one of the birds at Quivira National Wildlife Refuge, Kansas, was believed to be an ASY female. Finally, a male found dead at Columbia, Missouri, was determined to be an ASY male (Walter Wehtje, pers. comm.).

These results are in general accordance with Kerlinger and Lein's (1986) findings about the winter distribution among age-sex classes of Snowy Owls in the interior of North America. However, their data set was across many years and focused on the primary winter distribution, whereas our analysis is of a single irruptive event well south of their southernmost latitude criteria (ca. North-South Dakota border). Similar to the Kerlinger and Lein (1986) results for their central southern latitude region, we documented HY owls as to be dominant age class. Although HY females predominated in our sample for the winter 2011-2012 irruption in Kansas and Missouri, these data may be biased because that age-sex class is the easiest to identify and a large, 43%, of the total owls reported were not categorized to any age-sex class. Based on our specimen and photographic evidence, we suspect that the vast majority of the non-classified group were HY individuals, and it is conceivable that HY males may even have been the dominate sex-age class at this latitude.

All but three owls that were salvaged ($n=24$) were very emaciated and in a state of starvation, as indicated by very light mass coupled with extreme pectoral muscle and digestive tract atrophy. For 22 birds with mass data, only a HY female had light to moderate fat deposition (2025 g) and a HY male was considered to be very fat (1630 g): mass data for males ($n=15$, $\bar{x}=1035\pm 212$, range 815-1630 g); females ($n=7$; $\bar{x}=1473\pm 373$, range 1040-2025 g). Kerlinger and Lein (1988) stated that minimum winter mass for males and females with moderate fat were 1575 g and 1950 g, respectively. Regurgitated pellets ($n=4$) during December from one or more of the Smithville Lake owls contained American Coot (*Fulica americana*) and Ring-billed Gull (*Larus delawarensis*). Every owl specimen examined had hundreds of lice over the entire body.

Prior to the 2011-2012 event, the largest number reported during any irruption in Kansas and Missouri was 81 in 1974-1975, 13+ in 1980-1981, respectively (Thompson *et al.* 2011, Robbins and Easterla 1992). Obviously, because of the lack of internet and cell phone communication both those earlier events undoubtedly involved many birds that went unreported.

ACKNOWLEDGMENTS

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