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### **PHENOLOGY OF TWENTY-FIVE SPECIES OF MIGRATORY BIRDS ON A POSTAL ROUTE IN SEDGWICK COUNTY KANSAS**

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#### **ABSTRACT**

We compiled phenological data for 25 species of migratory birds, 14 passerines and 11 non-passerines, on a postal route in southeast Sedgwick County, Kansas. A 37 km transect was surveyed on approximately 1,200 days over a five-year or 1,826 day period. The transect passed through a diversity of habitat types. Presence/absence data for each species was recorded on each day. We calculated the mean arrival and departure date and the mean residence time of each species. Variation around the arrival date was significantly lower than that of departure date. Using our findings we make recommendations for the inclusion of non-game avian species for phenological monitoring in current Rural Carrier Mail Surveys used to monitor small game population trends.

#### **INTRODUCTION**

The arrival of migratory birds on the breeding grounds is one of the most anticipated annual animal migration events of the year. Many ornithologists, amateur and professional, maintain detailed records of their “first of season” sightings. These records can contribute greatly to our understanding of avian migration phenology. More recently, with wide scale acceptance of man-made global climate change, the study of avian migration phenology has taken on a more serious tone as a measure of humanity’s impact on a global scale (Cotton 2003). A number of studies have documented links between global climate change and shifts in migratory bird arrival and departure dates (Cotton 2003, Beaumont et al. 2006, Gordo and Sanz 2006, Parmesan 2006). These studies demonstrate the importance and value of detailed annual record keeping of bird arrival and departure dates.

Here we provide arrival and departure data for 25 species of migratory birds, 14 passerines and 11 non-passerines, found in south-central Kansas. We also investigated

variation around arrival and departure dates for the 25 monitored species. Our five-year data set comes from a postal carrier route on which the second author delivers mail.

## METHODS

Our field site was located primarily within the city limits of Derby in southeast Sedgwick, County Kansas. A 37 km length transect was surveyed approximately 1,200 days out of a five year period from 1 January 2004 to 31 December 2008. Thirty-one km were surveyed from a vehicle and 6 km on foot. The presence/absence of each bird species was recorded on a checklist each day. C. L. Hicks completed all surveys. Birds were identified by both sight and sound. We did not account for detectability differences between species but assumed detectability rates were constant across years. For our analysis we report data on 25 species that were recorded with regularity across all years, were easily detected by sight or sound, and were not confounded by the presence of wintering individuals. The survey transect passed through a diversity of habitat types including: urban, mature riparian, agriculture, pastureland, and early successional woodland.

First arrival dates were defined as the first day of detection for a particular species within a given year. Departure dates were defined as the final day a species was detected during a given year. Arrival and departure dates were converted into number of days since the previous winter solstice in order to standardize dates and nullify inconsistencies in the Gregorian calendar across years. For each of the 25 species we calculated an arrival and departure date for each year 2004-2008. We then calculated a mean ( $\pm$  SD) arrival and departure date, during non-leap years, for each species. Using mean arrival and departure dates we calculated the mean number of days each species was present along our survey transect.

In order to test whether or not the variance around the arrival date differed significantly from the variance around the departure date for the monitored bird community we pooled all species and years arrival dates and compared it to pooled species and years departure dates using a Levene's test ( $\alpha = 0.05$ )(Minitab 16, State College, PA, USA).

## RESULTS AND DISCUSSION

The 25 species in our study possess a wide range of arrival and departure dates (Table I). Annually, Killdeer is the first species to arrive and the last to depart. Eastern Phoebe heralds spring arriving just prior to the spring solstice each year. Turkey Vulture arrives late in March and is among the last to leave in early October. Indigo Buntings are among the last to arrive with a mean arrival date 155 day after the winter solstice or on 25 May and are the first to leave with a mean departure date 68 days later in early August. Other late arriving species include Yellow-billed Cuckoo and Eastern Wood-Pewee arriving in mid to late May. Other early departing species included Great-crested Flycatcher and House Wren, which depart by early August. Chimney Swift and Barn Swallow share a common departure date 291 days after the winter solstice or approximately 8 October. We found that 13 species arrive prior to the average last frost date in the spring (data source: NOAA). Many of these species include insectivorous species such as swallows and flycatchers. It could be that these species risk arriving in less than optimal weather conditions in order to secure territories on the breeding grounds. However, nearly all

species, with the exception of two, depart before the first frost date in the fall. Remarkably, the mean departure date for both Chimney Swift and Barn Swallow fall precisely on the average first frost date with Killdeer and Turkey Vulture following 3 or 4 days behind suggesting that these four species may move on freezing temperature gradients in the fall.

Arrival and departure date variance, as measured by standard deviation, varied widely among species (Table I). For example, Chimney Swift and Baltimore Orioles arrived  $\pm 2$  days of their mean arrival date each spring, whereas species such as Scissor-tailed Flycatchers, Ruby-throated Hummingbird, and Great Egrets varied more substantially in their arrival dates with  $\pm 14$ , 17, and 18 day standard deviations, respectively. The standard deviation around arrival dates was lower than that of the standard deviation of the departure dates for 19 of the 25 species suggesting that many species arrive on or near the same date more consistently than they depart. Pooling all species across years we found that the variance around arrival dates (591.94) was significantly less than that of departure dates (911.59) for this bird community (Levene's test: df arrival & departure = 124,  $F = 16.02$ ,  $P < 0.001$ ). However, some species such as Chimney Swift departed on nearly the same date each year,  $\pm 3$  SD.

Rural mail carriers have been widely used to monitor game populations in several states (Williams et al. 2003). The Rural Mail Carrier Survey has been ongoing in Kansas since 1966 and is used to monitor Northern Bobwhite (*Colinus virginianus*), Ring-necked Pheasant (*Phasianus colchicus*), and Wild Turkey (*Meleagris gallopavo*) populations as well as several small mammal species (Williams et al. 2003, McJunkin et al. 2005). We believe that postal carriers could make an excellent resource for monitoring shifting bird phenologies in response to climate change. Postal carriers could be asked to monitor the arrival and departure of easily recognizable migratory species. Based on our data we would recommend Turkey Vulture, Chimney Swift, and Barn Swallow as ideal candidates for phenological monitoring. All three species are easily recognizable species thus eliminating the need for extensive identification training. Secondly, all three species can be observed in both rural and urban environments and two are highly associated with human development. Lastly, all three species are highly migratory across large portions of their range thus reducing the odds of over-wintering individuals confounding arrival or departure data.

Finally, we believe our phenology data provides a more robust estimate of arrival and departure dates compared to traditional citizen science sources. First, all of our data was collected by one observer whose ability to detect species did not change dramatically over the study period thereby reducing observer bias. Additionally, our study was completed on defined daily route with two-thirds of the days surveyed over a five year period, thereby standardizing survey effort spatially and temporally, making it one of the most intensely monitored avian communities in the state of Kansas. We encourage all ornithologists or birders with valuable long-term notes and data sets to make them available either through donation to ornithological groups, submittal to electronic databases (such as e-Bird) or through publication in journals.

## LITERATURE CITED

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**Table 1. Mean arrival and departure dates ( $\pm$  SD) for 25 species of migratory birds and the mean number of days they resided along a postal route in southeast Sedgwick County, Kansas.**

Common Name	Scientific Name	Spring Arrival Date		Fall Departure Date		Mean days present along transect
		from winter solstice	Predicted Arrival Date	from winter solstice	Predicted Departure Date	
Great Egret	<i>Ardea alba</i>	132 $\pm$ 18	5/2	264 $\pm$ 33	9/11	132
Little Blue Heron	<i>Egretta caerulea</i>	126 $\pm$ 7	4/26	246 $\pm$ 12	8/24	120
Cattle Egret	<i>Bulbulcus ibis</i>	123 $\pm$ 8	4/23	269 $\pm$ 23	9/16	146
Turkey Vulture	<i>Cathartes aura</i>	98 $\pm$ 13	3/29	294 $\pm$ 7	10/11	196
Mississippi Kite	<i>Ictinia mississippiensis</i>	130 $\pm$ 7	4/30	271 $\pm$ 7	9/18	141
Killdeer	<i>Charadrius vociferus</i>	58 $\pm$ 10	2/17	295 $\pm$ 9	10/12	237
Upland Sandpiper	<i>Bartramia longicauda</i>	114 $\pm$ 9	4/14	251 $\pm$ 21	8/29	137
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	151 $\pm$ 5	5/21	235 $\pm$ 34	8/13	84
Common Nighthawk	<i>Chordeiles minor</i>	138 $\pm$ 7	5/8	282 $\pm$ 6	9/29	144
Chimney Swift	<i>Chaetura pelagica</i>	117 $\pm$ 2	4/17	291 $\pm$ 3	10/8	174
Ruby-throated Hummingbird	<i>Archilochus coltrbris</i>	138 $\pm$ 16	5/8	278 $\pm$ 12	9/25	140
Eastern Wood-Pewee	<i>Contopus virens</i>	143 $\pm$ 8	5/13	251 $\pm$ 22	8/29	108
Eastern Phoebe	<i>Sayornis phoebe</i>	85 $\pm$ 5	3/16	258 $\pm$ 43	9/5	173
Great-crested Flycatcher	<i>Myiarchus crinitus</i>	125 $\pm$ 3	4/25	230 $\pm$ 27	8/8	105
Western Kingbird	<i>Tyrannus verticalis</i>	125 $\pm$ 3	4/25	242 $\pm$ 9	8/20	117
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>	127 $\pm$ 14	4/27	252 $\pm$ 37	8/30	125
Red-eyed Vireo	<i>Vireo olivaceus</i>	135 $\pm$ 8	5/5	222 $\pm$ 37	7/31	87
Purple Martin	<i>Progne subis</i>	95 $\pm$ 9	3/26	252 $\pm$ 10	8/30	157
Barn Swallow	<i>Hirundo rustica</i>	109 $\pm$ 13	4/9	291 $\pm$ 18	10/8	182
House Wren	<i>Troglodytes aedon</i>	115 $\pm$ 6	4/15	232 $\pm$ 18	8/10	117
Gray Catbird	<i>Dumetella carolinensis</i>	130 $\pm$ 3	4/30	256 $\pm$ 30	9/3	126
Brown Thrasher	<i>Toxostoma rufum</i>	110 $\pm$ 4	4/10	241 $\pm$ 33	8/19	131
Indigo Bunting	<i>Passerina cyanea</i>	155 $\pm$ 11	5/25	223 $\pm$ 11	8/1	68
Dickcissel	<i>Spiza americana</i>	137 $\pm$ 8	5/7	240 $\pm$ 9	8/18	103
Baltimore Oriole	<i>Icterus galbula</i>	123 $\pm$ 2	4/23	265 $\pm$ 11	9/12	142

## 2012 REPORT OF THE KANSAS BIRD RECORD COMMITTEE

This report summarizes the activities of the Committee for the calendar year 2012. All reports are archived in The University of Kansas Natural History Museum, Lawrence, 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 are circulated. The Committee evaluated 29 records that comprised 33 species. Birds are listed in phylogenetic order under each of two categories: Records Accepted and Records Not Accepted. Taxonomy and nomenclature follow the American Ornithologist' Union *Checklist of North American Birds*, Seventh Edition, 1998, updated through the 53rd supplement, 2012, (Auk 129(3): 573-588).

After the English and scientific name the following, if available, are provided: KBRC record number, the number of individuals seen, with age or plumage notes; date(s) of observation; locality; 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 to the species status on the Kansas Ornithological Society (KOS) checklist. Records that were not accepted by the Committee have the observer' names omitted, and a brief explanation of the reasoning behind that decision.

Authors, when citing KBRC records from this report, are encouraged to give credit to the observer(s) of the record that submitted the report along with the citation of this report.

### RECORDS ACCEPTED

Yellow-billed Loon (*Gavia adamsii*), three documentations were received, all from Tuttle Creek Reservoir, Pottawatomie County. There is no reason to believe that more than one bird was involved, thus the following observations refer to the same bird: 2012-04a, one adult of unknown gender, 1 February 2012, reported and photographed by Will Chatfield-Taylor; 2012-04b, one juvenile/immature in winter plumage, 30 January to 2 February 2012, reported by Ted Cable, documented with photographs; and 2012-04c, one probable juvenile, 1 February 2012, reported by Clyde Ferguson. **Fifth state record.**

Wood Stork (*Mycteria americanus*), 2012-21, 15 July 2012, 2 sub-adults of unknown gender, Marais des Cygnes Wildlife Management Area, Unit G, Linn County, reported by Robert Trenton Reed, documented with photographs. **Tenth state record.**

Black Vulture (*Coragyps atratus*), 2012-25, 2 April 2012, one adult of unknown gender, Larned, Pawnee County, reported by Scott Seltman, documented with photographs. This is the farthest west sighting since 1885 (Thompson, M.C., C.A. Ely, B. Gress, C. Otte, S.T. Patti, D. Seibel, E.A. Young. 2011. *Birds of Kansas*. University Press of Kansas, Lawrence, Kansas. 528 pp.).

Black Vulture (*Coragyps atratus*), 2012-38, 24 March 2012, one adult of unknown gender, Hwy 38, ca. 15 miles WNW of Garnett, Anderson County, coordinates 33.94623,-95.4526512, reported by Jon King, documented with a photograph by John Bollin.

Swallow-tailed Kite (*Elanoides forficatus*), four documentations were received all from Johnson County in the same vicinity that clearly represent the same individual: 2012-24a, 12 August 2012, one of unknown age and gender, Taliaferro Park, Prairie Village, reported by Robert McElwain; 2012-24b, 24 August 2012, one of unknown age and gender, near the cross streets of W 51st Street and Pflumm Road, Shawnee, reported by Debbie Reasoner; 2012-24c, 27 August 2012, one sub-adult of unknown gender, 83rd and Mission Road, Prairie Village, reported by Nic Allen, seen by many observers for five of the next seven days, documented with a photograph; and 2012-24d 28 August 2012, one of unknown age and gender, 83rd and Mission Road, Prairie Village, reported by Mike Andersen, documented with a photograph.

Yellow Rail (*Coturnicops noveboracensis*), 2012-14, 18 May, 2012, one of unknown age or sex, Gardner Wetlands just west of Gardner, Johnson County, reported by Jay Newton.

Red-necked Stint (*Calidris ruficollis*), 2012-19, 1-2 July, 2012, one adult, Quivira National Wildlife Refuge, Little Salt Marsh, Stafford County, reported by Barry Jones, documented with photographs. **First state record**, thus it will be added to the Kansas Checklist.

Little Gull (*Hydrocoloeus minutus*), 2012-12, 28 April 2012, one first cycle, Cheyenne Bottoms Wildlife Area pool 1a, Barton County, reported by Mark Land, also observed by Will Chatfield-Taylor and Terry Swope, documented with photographs by Will Chatfield-Taylor. **Eighteenth state record**.

Great Black-backed Gull (*Larus marinus*), 2012-03, 1 February 2012, one in early pre-basic molt, 3rd cycle, Tuttle Creek Reservoir, Pottawatomie County, reported by Will Chatfield-Taylor, documented with a photograph by David Seibel. **Thirteenth state record**.

Red-naped Sapsucker (*Sphyrapicus nuchalis*), 2012-36, 2 May 2009, one adult female, Clark State Fishing Lake, Clark County, reported by Galen Pittman, documented with photographs. **Ninth state record**.

Plumbeous Vireo (*Vireo plumbeus*), 2012-28, 4 September 2012, one of unknown age and gender, Scott Lake State Park, Timber Canyon Campground, Scott County, reported by Tom Ewert.

Plumbeous Vireo (*Vireo plumbeus*), 2012-30, one of unknown gender, Low-water bridge on the Smoky Hill River located on Road 240, about 2 miles west of Russell Springs, Logan County, reported by Pete Janzen, also seen by Tom Ewert and Robert Reed, documented with photographs.

Violet-green Swallow (*Tachycineta thalassina*), 2012-08, 4 April 2012, one of unknown gender, Hain State Fishing Lake, Ford County, reported by Mike Rader.

Violet-green Swallow (*Tachycineta thalassina*), 2012-09, 8 April 2012, one adult male, Lake Lenexa, Lenexa, Johnson County, reported by Chris Hobbs.

Cave Swallow (*Petrochelidon fulva*), 2012-16, 1 June 2012, one adult of unknown gender, SE 120th Street at intersection with SE 140th Avenue, 3.5 miles east of the town of Isabel, Pratt County, reported by Pete Janzen. **Eighth state record.**

## RECORDS NOT ACCEPTED

Yellow-billed Loon (*Gavia adamsii*), 2012-33, one adult in breeding plumage of unknown gender, 25 October 2012, small pond east of Emporia, Lyon County. The details provided did not eliminate other loon species.

Clarke's Grebe (*Aechmophorus clarkii*), 2012-11, two of unknown age and gender, 28 April 2012, Horsethief Reservoir, Hodgeman County. The photos received with this report were of two Western Grebes (*Aechmophorus occidentalis*).

Glossy Ibis (*Plegadis falcinellus*), 2012-10, 14 of unknown age and gender, 28 April 2012, Horsethief Reservoir, Hodgeman County. The details necessary to separate the *Plegadis* species are not provided. The birds identifiable in the documenting photograph are White-faced Ibis (*Plegadis chihi*).

White-tailed Kite (*Elanus leucurus*), 2012-15, 29 May 2012, one adult, Clinton State Park, Douglas County. The short duration of the sighting and the details provided did not eliminate other species that could be confused with White-tailed Kite.

White-rumped Sandpiper (*Calidris fuscicollis*), 2012-27, 15 to 17 of unknown gender, 25 August 2012, Kansas State University Beef Cattle Research Center lagoon, Manhattan, Kansas; Lat +39.225171 Long -96.593539, Riley County. The details provided did not eliminate similar appearing shorebirds.

White-rumped Sandpiper (*Calidris fuscicollis*), 2012-35, one of unknown age and gender in alternate plumage, 4 July 2012, Quivira National Wildlife Refuge, Stafford County. The details provided did not eliminate similar appearing shorebirds.

Blue-throated Hummingbird (*Lampornis clemenciae*) 2012-29, 19 July 2012, one adult male, in a backyard, Russell, Russell County. Documentation did not provide enough details necessary for this potential first state record. (This is the second undocumented record for this species in Kansas – Editor.)

White-throated Sparrow (*Zonotrichia albicollis*) 2012-22, 12 June 2012, one singing, Cedar Niles Park, 127th and Cedar Creek Bridge, Johnson County. The documentation of song and spectrograms did not eliminate similar sounding species.

Hepatic Tanager (*Piranga flava*), 2012-18, 5 July 2012, one adult male, in a backyard on 7000 block of Kimberly, Johnson County. The report has minimal details and does not eliminate any of the other *Piranga* species seen in Kansas.

Bullock's Oriole (*Icterus bullockii*), 2012-37, 19 May 2012, one first year male, Wyandotte County Lake Park, behind the Schlagle Library, Wyandotte County, documented with one photo. The head on photo does not eliminate a possible older female Baltimore Oriole.

Members of the KBRC voting on these records:

Nic Allen  
Michael Andersen  
Doris Burnett  
Kevin Groeneweg  
Mark Land (secretary)  
Terry Mannell  
Mark Robbins (chair)

Submitted by Mark E. Land KBRC Secretary