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### THE FIRST SUCCESSFUL NESTING RECORD OF THE COMMON RAVEN (*Corvus corax*) IN KANSAS

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Abstract – Common Ravens (*Corvus corax*) were residents throughout much of Kansas during the late 1800s. However, their numbers declined during the last decades of the 19th century and by the early 20th century they were extirpated from the state. On 10 May 2010, an active raven nest with three nestlings was found in the Austrian pine (*Pinus nigra*) plantation on the Cimarron National Grassland, four miles north of Elkhart, Morton County, Kansas. Feathers collected from the young birds and an adult feather found below the nest were analyzed at the University of Kansas. The results of these DNA analyses confirmed the identification of these ravens as Common Ravens. This record constitutes the first recorded successful nesting of Common Raven in Kansas.

### INTRODUCTION

Common Ravens (*Corvus corax*) were residents throughout much of Kansas during the late 1800s. However, their numbers declined during the last decades of the 19th century and early 20th century, possibly in conjunction with the elimination of the American bison (*Bison bison*). By the 1930s they were considered to be extirpated from the state (Thompson et al. 2011).

In recent years, Common Ravens twice attempted to nest on the Cimarron National Grasslands but each time they abandoned their nests prior to hatching young. In 2006 on 4 April, Robbins and Nyari found a pair of Common Ravens at Point of Rocks (Robbins et al. 2006). Patti and Thompson found a raven nest at this location on 4 May, with one adult apparently incubating eggs on 6 May. On 9-12 May, Cable observed them stripping bark from nearby trees, but the ravens were absent on 22 May, and not seen again at this nest site. In 2007, a pair of Common Ravens again attempted to nest. This nest was in a solitary tree adjacent to a windmill south of the Western Crossing of the Cimarron River. This nest was abandoned without producing any young.

## INITIAL NESTING

On 10 May 2010, one of the authors (Wiggins) found an active raven (*Corvus* sp.) nest in the Austrian pine (*Pinus nigra*) plantation at the Cimarron National Grassland Tunnerville Work Station, four miles north of Elkhart, Morton County, Kansas (37.050° N, 101.897° W). The following day Cable and Wiggins photographed three large nestlings and captured video that recorded the voices of the adults. Initially, neither we nor other subsequent observers felt confident identifying these birds to species. Characteristics of the adults were ambiguous. One adult appeared larger than the other and their voices seemed different (one higher and one lower). The nest was quite small (roughly 45-50 cm in outer diameter) and had barbed wire woven into it, both often indicative of Chihuahuan Raven (*Corvus cryptoleucus*) nests (Bednarz and Raitt 2002). However, the size of the young birds indicated early egg dates typical of Common Raven (*Corvus corax*). Egg laying for Chihuahuan Ravens is May and early June, whereas Common Ravens lay their eggs in early March to mid-April (Boarman and Heinrich 1999).

## DNA ANALYSIS

These ravens were left unidentified until at the request of the authors, USDA Forest Service personnel collected feathers from two of the young birds. Mark Robbins also visited the nest on 1 June 2010. Two nestlings were present with a third individual deceased on the ground below the nest. Three secondary feathers were collected from the deceased juvenile bird as well as one adult primary feather found on the ground. The carcass was too rotten to save as a voucher specimen, but the juvenile and adult feathers were saved as vouchers and deposited in the University of Kansas Natural History Museum and Biodiversity Institute (KUNHM 120378 and 120379, respectively). All four sets of feathers were analyzed for DNA at the University of Kansas, three from young birds and one adult; however, it is uncertain whether the three sets of juvenile feathers are from two or three individual nestlings.

Whole genomic DNA was extracted from all feathers using a guanidine thiocyanate method (Esselstyn et al. 2008). We sequenced the entire mtDNA cytochrome b gene. Target DNA fragments were amplified using polymerase chain reaction (PCR) in 13  $\mu$ l reactions using Promega Go-*Taq* DNA polymerase with annealing temperatures of 58, 54, and 50° C. We screened amplified double-stranded PCR products on high-melt 2% agarose gels and purified them with 10% Exo-SAP-IT™ (GE Healthcare Bio-Sciences Corp.). We cycle-sequenced purified PCR products in both directions with the same primer pairs used in PCR for 25 cycles using the ABI Big Dye Terminator Cycle-Sequencing Kit version 3.1 (Applied Biosystems Inc., Foster City, CA). We performed sequencing on an ABI Prism 3730 high-throughput capillary electrophoresis DNA analyzer and resolved contigs by hand using Sequencher 4.9 (GeneCodes Corp.).

The full cytochrome b gene (1,143 bp) was sequenced for all four feathers. Sequences from the two vouchered feathers are deposited in GenBank (Accession: JQ994492–JQ994493). All four Kansas samples were of an identical mitochondrial haplotype. We added the sequences to an alignment of representative samples from each of the three main clades recovered by Omland et al. (2000): Holarctic Common Raven; Californian Common Raven; and Chihuahuan Raven in order to identify the Kansas samples. Bayesian phylogenetic analyses were conducted in MrBayes 3.1 with default parameter settings and a consensus tree was generated (results not shown). The Kansas samples were 0.2% divergent in uncorrected Cytb p-distances from the Holarctic clade of Common Raven, while they were 3.6% and 4.2% divergent from the California Common Raven and Chihuahuan Raven clades, respectively. These results are

highly indicative that the feathers came from Common Ravens, and unequivocally placed them within the Holarctic clade of Common Raven rather than the genetically distinct "California" Common Raven.

### **SUBSEQUENT NESTING AND RECORDS**

On 9 April 2011, five Common Raven nestlings were found in the same nest at the Work Station. The adults and young were seen by many observers during the spring meeting of the Kansas Ornithological Society in May 2011. During the Christmas Bird Count on 30 December 2011, two pairs of Common Ravens were observed near the work station nest site. During the spring of 2012, the raven nest tree, along with most other pines in the work station, was removed by USFS personnel to control the spread of disease. However, on 4-5 March 2012 Cable, Wiggins and Scott Seltman found a pair of Common Ravens in trees just north of the work station. A nest that may have been a raven nest was also seen in this grove, indicating that Common Ravens may have attempted to nest in 2012, even after the destruction of the work station pines.

### **DISCUSSION**

This species' status may be in a period of dramatic change. After being absent from Kansas for most of the 20th century, this species has suddenly become regular. Except for 2009, Common Raven records exist in Morton County for every year between 2003 and 2011 (Cable and Seltman 2011) as well as in 2012. During this period, large flocks of Common Ravens were sometimes seen flying along the Cimarron River. In light of these recent events, it appears that more Common Raven nesting attempts may be expected in extreme southwest Kansas.

### **ACKNOWLEDGMENTS**

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**UNUSUAL DEATH OF WESTERN KINGBIRD.**— On 5 February 2012, while playing with my cousin at my Grandpa’s farm in Meade County, Kansas, we found a dead bird tangled up in string in a tree. We thought it was part of a nest. We went and got my dad, Tom Flowers, who told us he thought it was a Western Kingbird (*Tyrannus verticalis*) tangled up in some plastic bailing twine. It was about 12 feet up in a Siberian Elm (*Ulmus pumila*) tree.

The next day Tom Flowers took some photographs, one of which is included (Figure 1), and used a pole saw to cut down the limb with the bird and twine. He said he had never seen anything like this before and that we should write about it. Searching the literature I found that kingbirds sometimes use string, twine, paper, roots, milkweed, wool, cow hair and even snake skins to make their nests (Harrison, H. H. 1979. *A Field Guide to Western Birds’ Nests*, The Peterson Field Guide Series. Houghton Mifflin Company, Boston, Massachusetts. 279 pp.; and Terres, J. K. 1991. *The Audubon Society Encyclopedia of North American Birds*. Random House Company, New Jersey. 1109 pp.). Initially, I thought the kingbird froze to death, but T. Flowers said it died a long time ago, probably in the summer. He thought the bird was using the twine to build its’ nest and it got caught in the tree.

I found no documentation of plastic bailing twine being documented in any bird deaths but it has been documented as being used in nest construction by other species. A lot of bailing twine is found in our area where cows are fed hay, even along road side ditches, fence lines, and hedge rows. Farmers and ranchers should try to clean up plastic bailing twine so it does not kill other Western Kingbirds.

I would like to thank Tom Shane for encouraging me to write this note and my father, Tom Flowers, for helping me with identification and the use of his library.

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**Figure 1:** Close-up of Western Kingbird foot tangled in plastic bailing twine. 6 February 2012, photo by Tom Flowers.