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SUMMER BIRDS FROM CHEROKEE COUNTY, KANSAS

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Emphasis in our knowledge of the 176 species of birds known to breed in Kansas has heretofore been placed on northeastern Kansas (e.g., see Johnston, *Univ. Kansas, Publ., Mus., Nat. Hist.*, 12:577-654, 1964). In comparison with those data, observations on summer birds from other areas of Kansas have special interest. From 4 June to 11 June, 1964, I studied birds in Cherokee County, the southeasternmost county in the state. In that time I spent roughly 80 hours in the field, and took notes on 75 species of birds. Seventy-four specimens (18 skins, 54 alcoholics, two skeletons) were collected, documenting the occurrence of 33 species of birds; nests or young were found, or breeding females were taken, for 26 species. It is further reasonable to assume that most of the species recorded were breeding in the area. Two species, the Swainson Thrush and the Yellow-bellied Flycatcher, certainly were exceptions; they were far out of their breeding range, and examination of their gonads showed them to be reproductively inactive. So few Great Blue Herons, Black-and-white Warblers, and Yellow Warblers were found that it is reasonable to guess that they were migratory stragglers, or otherwise non-breeding birds. All specimens were deposited in the Museum of Natural History of the University of Kansas, Lawrence, Kansas, and catalogue numbers are those of the ornithological collection.

Most of my field work was done in Township 34 S, Range 35 E, the southeasternmost township of Cherokee County, and near the towns of Galena and Riverton; occasional observations were made in other townships. I collected in all conspicuous habitats, but woodland areas were emphasized in my work.

MAJOR HABITATS

Cherokee County bears many climatic, floral, and faunal affinities with northeastern Kansas, but the average annual rainfall in Cherokee County is 40 to 50 inches instead of 30 to 40 inches as in northeastern Kansas, and the vegetation in Cherokee County is denser and more lush, especially in riparian situations. Tall stands of riparian deciduous timber including sycamore, hackberry, elm, cottonwood, willow, and black walnut, with a rank understory, border Spring River and Shoal Creek, the primary waterways in the area. Common birds in this kind of vegetation are, Yellow-billed Cuckoo, Red-bellied Woodpecker, Downy Woodpecker, Great Crested Flycatcher, Eastern Wood Pewee, Carolina Chickadee, Tufted Titmouse, Red-eyed Vireo, Prothonotary Warbler, Parula Warbler, Kentucky Warbler, Cardinal, and Indigo Bunting. Adjacent to these waterways are a few marshes containing cattail, willow, and smartweed. The Red-winged Blackbird is the common bird in these areas. Lacustrine water and riparian timber meet without a marshy interface in many backwater areas. The Prothonotary Warbler is commonest in these places.

Much of the flood plain of Shoal Creek and Spring River has been cleared for farming, and is cultivated (planted to wheat and corn), grazed, or fallow. In places, old-field areas of waist-high grass and isolated clumps of scrub honeylocust, elm, and oak persist. Here the Bobwhite, Eastern Meadowlark, Brown-headed Cowbird, Dickcissel, and Lark Sparrow are the commonest species of birds. The expression of the above habitats in Cherokee County resembles, in gross aspects, that of similar areas to the north in Kansas.

TABLE 1
COMPARISON OF RELATIVE DENSITIES OF BREEDING BIRDS IN TWO KINDS OF
VEGETATIONAL STANDS IN SOUTHEASTERN KANSAS.

| Species | Mature Oak | Scrub Oak and Edge |
|--------------------------|----------------|--------------------|
| Yellow-billed Cuckoo | 3 ¹ | 3 |
| Red-bellied Woodpecker | 2 | 0 |
| Downy Woodpecker | 2 | 2 |
| Great Crested Flycatcher | 2 | 0 |
| Eastern Wood Pewee | 3 | 1 |
| Blue Jay | 2 | 0 |
| Carolina Chickadee | 1 | 2 |
| Tufted Titmouse | 3 | 0 |
| White-breasted Nuthatch | 1 | 0 |
| Robin | 1 | 0 |
| Prairie Warbler | 0 | 2 |
| Summer Tanager | 2 | 1 |
| Blue Grosbeak | 0 | 1 |
| Indigo Bunting | 0 | 2 |
| Rufous-sided Towhee | 0 | 1 |
| Field Sparrow | 0 | 3 |

¹ 3 = high density; 2 = moderate density; 1 = low density; 0 = virtually absent.

The infertile, rocky soil of the upland areas supports oak forests with reduced understory, different from other areas in the state. Two types of oak forests occur: first the taller, fairly dense stands, with the canopy 35 to 40 feet high, and second, the shorter, scrub oak areas, with the canopy discontinuous and to 15 or 20 feet high. The dominant species of oak in the area is the blackjack oak, *Quercus marilandica*; there is no indication that these areas have been recently cleared. Table 1 summarizes the differences in density of the common birds of the oak forests. Not all woodlands fall clearly into these two types, but for the sake of convenience, I studied them as separate units.

The area around Galena formerly was a center of strip and open-pit mining activity. Today mined areas remain as barren gravel piles or as infertile hillsides supporting scattered scrub oak growth; here the avifauna appears to be depauperate.

BREEDING SCHEDULES

Conclusions about the breeding schedules (seasons) of species when only a small series of records is available are of limited value. To obtain an ordered picture of such breeding schedules, data from the entire breeding season, and preferably from several years, are desirable. My findings, however, do indicate trends that tend to support those outlined by Johnston (*op. cit.*).

Specimens of Hairy Woodpecker, Downy Woodpecker, Rough-winged Swallow, Carolina Chickadee, Tufted Titmouse, and White-breasted Nuthatch indicate that the breeding cycle, or at least the first portion of it, had been completed by 4 June to 11 June.

A second group of species, the Wood Duck, Blue Jay, Mockingbird, Loggerhead Shrike, Parula Warbler, Prairie Warbler, Cardinal, Dickcissel, and Lark Sparrow, had advanced young in nests or were attending fledged young.

A third group, the Yellow-billed Cuckoo, Eastern Wood Pewee, Barn Swallow, Prothonotary Warbler, Red-winged Blackbird, Indigo Bunting, and Field Sparrow, seemed to be beginning nesting activity in the period of my study.

SPECIES NOT RECORDED

A speculative list of species that probably breed in Cherokee County, but that I failed to find, would be uninteresting. With respect to habitat, however, the absence of certain species was more notable than their presence would have been; notably, the Bell Vireo, Yellow-breasted Chat, and American Redstart, species that are con-

spicuous in woodland edge in northeastern Kansas, were not found. Failure to find either the Bewick Wren or the House Wren was apparently due to bias of my field work, for "wrens" were said to be common in Galena. The Whip-poor-will, likewise, was said to occur in at least one woodland in the south part of Galena. Surprisingly, only small numbers of Red-headed Woodpeckers, Catbirds, Brown Thrashers, Yellow Warblers, and Rufous-sided Towhees were found.

I thank the Herrelsons of Galena and Richard Scott of Riverton for their kind assistance in the field.

ACCOUNTS OF SPECIES

In the list below, one asterisk indicates probable breeding in Cherokee County (based on a reproductively active male taken) and two asterisks indicate definite breeding (based on a nest or young, or on a reproductively active female taken). The abbreviations "sco" and "snco" refer, respectively, to "skull completely ossified" and "skull not completely ossified"; the former condition is herein used as an indication of adulthood.

Great Blue Heron: *Ardea herodias* Linnaeus.—Single birds were seen along the shores of larger waterways. Local persons did not know of any colonies, and birds seen may well have been non-breeding individuals.

Green Heron: *Butorides virescens* (Linnaeus).—Three were seen in a marsh and flooded woodland, 2½ miles west Galena.

*Wood Duck: *Aix sponsa* (Linnaeus).—One to three adults were found frequently along larger waterways. Six ducklings (one taken: 45170) were seen in a flooded woodland ("Roper's Slough"), 2½ miles west Galena, 8 June.

Turkey Vulture: *Cathartes aura* (Linnaeus).—One to eight birds were frequently seen overhead.

Red-tailed Hawk: *Buteo jamaicensis* (Gmelin).—A pair regularly worked above mature oak woodland, 1½ miles west Galena.

Red-shouldered Hawk: *Buteo lineatus* (Gmelin).—Two occurred in dense riparian elm-sycamore-cottonwood woodland, ½ mile north, 1½ miles west Galena.

Broad-winged Hawk: *Buteo platypterus* (Vieillot).—One was seen over a scrub oak area, ½ mile north Galena.

Swainson Hawk: *Buteo swainsoni* Bonaparte.—One was seen above mature oak woodland near open country.

Sparrow Hawk: *Falco sparverius* Linnaeus.—Uncommon, near towns.

Bobwhite: *Colinus virginianus* (Linnaeus).—Paired birds occurred, but no young were seen; common in woodland edge with rank undergrowth and in dense old-field.

Killdeer: *Charadrius vociferus* Linnaeus.—Uncommon in pasturelands and fallow fields.

Rock Dove: *Columba livia* Gmelin.—Commonly seen near farms, and towns. Found in abandoned mine shafts and "caves" near Galena, where said to nest.

**Mourning Dove: *Zenaidura macroura* (Linnaeus).—Commonly found in fields, along roadsides, and in woodland edge, congregating in foraging flocks in wheat fields. Specimens (2): male, 45171, testis 10 × 5 mm; female, 45172, one egg in oviduct, another large follicle (shot with, and probably paired with, 45171).

**Yellow-billed Cuckoo: *Coccyzus americanus* (Linnaeus).—Commonly heard in all woodland habitats, and one of the conspicuous species in the area. Specimens (3): male, 45173, testis 10 × 5 mm; female, 45174, two ruptured follicles, and two large ova (shot with, and probably paired with, 45173); male, 45175, testis 9 × 4 mm.

Barred Owl: *Strix varia* Barton.—Two pairs were located in dense riparian woodlands.

Chuck-will's widow: *Caprimulgus carolinensis* Gmelin.—Commonly heard in mature oak woodlands.

Common Nighthawk: *Chordeiles minor* (Forster).—Commonly seen over all habitats. Present, and probably nesting, in gravel piles near abandoned mines.

Chimney Swift: *Chaetura pelagica* (Linnaeus).—Commonly seen over all habitats. Interesting foraging behavior was observed on 10 June. Two and three birds were seen flying low over Shoal Creek, and dipping their heads, and sometimes their

wing-tips, into the water. There were many dead insects on the surface of the water, and the swifts were probably eating them. They continued this activity for 15 to 20 minutes, indicating that they were not merely drinking.

*Ruby-throated Hummingbird: *Archilochus colubris* (Linnaeus).—A common species in dense riparian woodlands. Hummers seem to be commoner here than I have found them elsewhere in Kansas. Specimens (2): male, 45176, testis 3×2 mm; male, 45177, testis 2 mm.

*Yellow-shafted Flicker: *Colaptes auratus* (Linnaeus).—Uncommonly seen in mature riparian woodlands. Specimen (1): male, 45178, testis 13×5 mm.

**Red-bellied Woodpecker: *Centurus carolinus* (Linnaeus).—Commonly seen in all mature woodlands. Specimens (1): female, 45179, brood patch and one ruptured follicle.

Red-headed Woodpecker: *Melanerpes erythrocephalus* (Linnaeus).—One was seen in open woodland, 2 miles west Galena.

**Hairy Woodpecker: *Dendrocopos villosus* (Linnaeus).—One was taken in dense riparian woodland, $\frac{1}{2}$ mile north, $1\frac{1}{2}$ mile west Galena. Specimen (1): young male, 45180.

**Downy Woodpecker: *Dendrocopos pubescens* (Linnaeus).—Commonly seen in all woodlands. Specimen (1): young male, 45181.

*Eastern Kingbird: *Tyrannus tyrannus* (Linnaeus).—Recorded in low density in woodland edge, on islands in Spring River, and in open country. Birds were paired and probably nesting. Specimen (1): male, 45182, testis 15×7 mm.

Scissor-tailed Flycatcher: *Muscivora forficata* (Gmelin).—Three were seen. Habitat preferences are like those of the Eastern Kingbird.

*Great Crested Flycatcher: *Myiarchus crinitus* (Linnaeus).—Commonly seen in all mature woodlands. Specimen (1): male, 45183, testis 8×5 mm, cloaca enlarged and brood patch (?).

Eastern Phoebe: *Sayornis phoebe* (Latham).—Fairly commonly found near bridges.

Yellow-bellied Flycatcher: *Empidonax flaviventris* (Baird and Baird).—One was shot, 2 miles west Galena, 5 June. Specimen (1): adult female, 45184, ovary inactive, moderate fat.

*Traill Flycatcher: *Empidonax traillii* (Audubon).—Present in moderate density in riparian woodlands with dense understorey. One singing male was found, 2 miles north Galena, 4 June; a paired female was shot (45185), 2 miles north Galena, 4 June; one singing male was shot (45186), 2 miles west Galena, 4 June, and another heard there 6 June. Specimens (2): female, 45185, ovary inactive; male, 45186, testis 6×5 mm.

**Eastern Wood Pewee: *Contopus virens* (Linnaeus).—Commonly seen in mature oak and riparian woodlands. Specimens (2): male, 45187, testis 7×3 mm; female, 45188, two large ova, oviduct enlarged.

*Horned Lark: *Eremophila alpestris* (Linnaeus).—Present in low density in pastureland and fallow fields. Specimen (1): male, 45189, testis 11×7 mm.

**Rough-winged Swallow: *Stelgidopteryx ruficollis* (Vieillot).—Commonly seen in foraging flocks over Spring River; present in low density over other habitats. Specimens (5): male, 45190, testis 7×6 mm, sco; female, 45191, ovary inactive, snco; male, 45192, testis 6×4 mm, sco; male, 45193, testis 5×4 mm, sco; male, 45194, testis small, snco.

**Barn Swallow: *Hirundo rustica* Linnaeus.—Commonly seen over all habitats. Ten nests were found seven to ten feet high in barn, 2 miles west Galena, 6 June. Clutch size ranged from two to five, with 3.6 as average, and four as commonest size.

Purple Martin: *Progne subis* (Linnaeus).—Present in moderate density, especially near towns where apparently nesting in "martin" houses.

**Blue Jay: *Cyanocitta cristata* (Linnaeus).—Commonly found in all mature woodlands; less common in second-growth and woodland edge. Specimens (2): juvenile female, 45195, ovary inactive; male, 45196, testis 3 mm, attending 45195.

Common Crow: *Corvus brachyrhynchos* Brehm.—Three to five birds were frequently seen.

**Carolina Chickadee: *Parus carolinensis* Audubon.—Present in high density in riparian woodlands, moderate density in scrub oak and edge, and low density in mature

oak woodland (where largely replaced by following species, see Table 1). Specimens (10): sex ♀, 45197, snco; male, 45198, testis ca. 1 mm, sco; male, 45199, testis ca. 1 mm, sco; male, 45200, testis 6 × 4 mm, sco; male, 45201, testis small, snco; male, 45202, testis 1 mm, snco; female, 45203, ovary inactive, snco; male, 45204, testis ca. 2 mm, sco; male, 45205, testis small, snco; sex?, 45206, snco.

••Tufted Titmouse: *Parus bicolor* Linnaeus.—Present in moderate density in riparian woodlands, high density in mature oak woodlands (see above species), and virtually absent in scrub oak and second-growth (see Table 1). Specimens (5): male, 45207, testis 10 × 7 mm, sco; male, 45208, testis 6 × 4 mm, sco; male, 45209, testis 5 × 4 mm, sco; female, 45210, ovary inactive, snco; female, 45211, ovary inactive, snco.

••White-breasted Nuthatch: *Sitta carolinensis* Latham.—Present in low density in mature oak woodlands. Specimens (2): male, 45212, testis ca. 1 mm, snco; male, 45213, testis ca. 1 mm, snco.

Carolina Wren: *Thryothorus ludovicianus* (Latham).—One was seen at edge of a woodland ½ mile east Riverton, 7 June.

••Mockingbird: *Mimus polyglottos* (Linnaeus).—Commonly seen in woodland edge, dense brush in open country, and near houses. Large, attended young seen, 2 miles west Galena, 5 June and 8 June.

Catbird: *Dumetella carolinensis* (Linnaeus).—A pair was seen, ½ mile east Riverton, at edges of a willow-cattail marsh.

Brown Thrasher: *Toxostoma rufum* (Linnaeus).—One singing bird was seen in Missouri adjacent to Galena, Kansas; "thrushes" were said to occur in Galena.

Robin: *Turdus migratorius* Linnaeus.—Present in moderate density in towns, and in low density in riparian woodlands.

Swainson Thrush: *Hylocichla ustulata* (Nuttall).—One was shot, 2 miles north Galena, 4 June. Specimen (1): female, 45214, ovary inactive, sco, with moderate fat.

Eastern Bluebird: *Sialia sialis* (Linnaeus).—Commonly seen adjacent to mature oak woodland.

Blue-gray Gnatcatcher: *Poliophtila caerulea* (Linnaeus).—Locally common in dense riparian or wet deciduous woodlands with rank understory.

••Loggerhead Shrike: *Lanius ludovicianus* Linnaeus.—Present in low density at the edge of fields, and in old-field. Three flying young, attended by parents, were seen 4 miles north Galena, 10 June.

••Starling: *Sturnus vulgaris* Linnaeus.—Commonly seen in woodlands, parklands, and on telephone wires. A juvenile was found dead, 1 mile west Galena, 6 June (specimen not saved).

•Red-eyed Vireo: *Vireo olivaceus* (Linnaeus).—Commonly heard in mature deciduous woodlands. Specimen (1): male, 45215, testis 6 × 5 mm.

Warbling Vireo: *Vireo gilvus* (Vieillot).—Present in low density in tall deciduous trees (especially cottonwood) near water, or in towns.

Black-and-white Warbler: *Mniotilta varia* (Linnaeus).—One was seen in riparian woodland, 2 miles west Galena.

••Prothonotary Warbler: *Protonotaria citrea* (Boddaert).—Commonly found in mature riparian woodlands, especially in tall trees near water. Specimens (5): male, 45216, testis 6 × 5 mm; male, 45217, testis 10 × 7 mm, cloaca enlarged; female, 45218, one ruptured follicle, three large ova, brood patch; male, 45219, testis 6 × 5 mm; male, 45220, testis 5 × 4 mm, cloaca enlarged.

••Parula Warbler: *Parula americana* (Linnaeus).—Commonly heard in mature riparian woodlands with rank understory. Specimens (4): male, 45221, testis 6 × 4 mm; male, 45222, testis 8 × 6 mm; juvenile female, 45223, ovary inactive; male, 45224, testis 4 × 3 mm.

Yellow Warbler: *Dendroica petechia* (Linnaeus).—One was seen in riparian woodland, 2 miles west Galena.

••Prairie Warbler: *Dendroica discolor* (Vieillot).—Three singing males (one taken, 45225) were found in short scrub oak woodland, one mile north Galena, 10 June. A nest and three specimens taken there 11 June, constitutes the first breeding record for Kansas (Rising, Bull. Kansas Ornith. Soc., 15:26, 1964). Specimens (4): male, 45225, testis 6 × 4 mm; juvenile female, 45226, ovary inactive; female, 45227, ovary inactive; sex ?, juvenile, 45228. Nest parasitized by Brown-headed Cowbird.

Kentucky Warbler: *Oporornis formosus* (Wilson).—Commonly heard in riparian woodlands with rank understory.

*Yellowthroat: *Geothlypis trichas* (Linnaeus).—Locally common, especially in small willows standing in water. Specimen (1): male, 45229, testis 6×4 mm.

House Sparrow: *Passer domesticus* (Linnaeus).—Commonly seen near towns and farms.

Eastern Meadowlark: *Sturnella magna* (Linnaeus).—Present in moderate density in pastureland and old-field.

**Red-winged Blackbird: *Agelaius phoeniceus* (Linnaeus).—Commonly seen near small ponds, or along small streams in open country. Twenty-three nests were found in smartweed, willow, and cattail, $2\frac{1}{2}$ miles west Galena, 7 June and 8 June. Nests were placed two to three feet high. Clutch size ranged from three to four, with 3.9 the average, and four the commonest size. One nest was parasitized by the Brown-headed Cowbird.

*Orchard Oriole: *Icterus spurius* (Linnaeus).—Present in low density in woodland edge, second-growth, and old-fields. Specimen (1): male, 45230, testis 7×6 mm.

Baltimore Oriole: *Icterus galbula* (Linnaeus).—Present in moderate density in parklands, especially near houses.

Common Grackle: *Quiscalus quiscula* (Linnaeus).—Commonly seen in parkland near houses.

**Brown-headed Cowbird: *Molothrus ater* (Boddaert).—Commonly seen in pastures near livestock. Specimens (2): juvenile, 45231; juvenile, 45232, taken from nest of Prairie Warbler. One young was found in the nest of a Red-winged Blackbird, 7 June.

*Summer Tanager: *Piranga rubra* (Linnaeus).—Present in moderate density in mature woodlands. Specimen (1): male, 45233, testis 9×5 mm, cloaca enlarged.

**Cardinal: *Richmondia cardinalis* (Linnaeus).—Commonly seen in rank riparian woodlands with dense understory. Specimens (2): male, 45234, testis 6×5 mm; male, 45235, testis 12×6 mm. A nest was found with two warm eggs, 3 feet high in dense riparian woodland, 4 miles north Galena, on 4 June; two juveniles, able to fly, but attended by parents, were seen $\frac{1}{2}$ mile east Riverton, in scrub willow and sumac, 7 June.

Blue Grosbeak: *Guiraca caerulea* (Linnaeus).—Uncommonly found in second-growth, scrub, and edge situations. Specimen (1): male, 45236, testis 9×7 mm, cloaca enlarged.

**Indigo Bunting: *Passerina cyanea* (Linnaeus).—Commonly heard in mature riparian woodlands with rank understory, rank second-growth, and woodland edge. Specimens (5): female, 45237, three ruptured follicles and one large ova; male, 45238, testis 8×5 mm; female, 45239, ovary inactive; male, 45240, testis 9×7 mm, cloaca enlarged; female, 45241, one ovum enlarged to 4 mm, and another large ovum, and brood patch.

**Dickcissel: *Spiza americana* (Gmelin).—Commonly seen in old-field. Two young, found just out of nest and attended by parents, 2 miles west Galena, 11 June.

American Goldfinch: *Spinus tristis* (Linnaeus).—Small flocks were commonly seen in or near woodlands.

Rufous-sided Towhee: *Pipilo erythrophthalmus* (Linnaeus).—A singing male was seen in scrub oak, 1 mile north Galena.

*Lark Sparrow: *Chondestes grammacus* (Say).—Commonly found in pastureland and open fields. A nest found 2 miles west Galena contained five $\frac{1}{2}$ -grown young, 5 June; nest-site abandoned, 8 June.

*Field Sparrow: *Spizella pusilla* (Wilson).—Commonly found in scrub oak woodlands, and oak woodland edge. Specimens (2): male, 45242, testis 7×5 mm; female, 45243, one ruptured follicle, one large ovum, and two other enlarged ova.

Museum of Natural History, The University of Kansas, Lawrence, Kansas, 14 February, 1965.

The summer status of wood pewees in southwestern Kansas.—Although the Eastern Wood Pewee (*Contopus virens*) is a common and conspicuous summer resident in eastern Kansas, the western distributional limits of the species in Kansas are poorly

known. There is a specimen (The University of Kansas Museum of Natural History catalogue number 34188) of a breeding female taken 16 miles north and one mile east of Stafford, Stafford County, Kansas, near the center of the state. The Western Wood Pewee (*Contopus sordidulus*) breeds east to central North Dakota, western South Dakota, and central and western Texas (A.O.U. check-list of North American birds, 1957: 348-49). A breeding female (KU 34092) was taken five miles north of Harrison, Sioux County, in western Nebraska.

On 7 June 1964, Jon C. Barlow shot an adult male wood pewee (KU 45639). It contained little fat, and the left testis was enlarged to 7 mm. The bird was in riparian woodland (primarily *Populus*) along the Cimarron River, seven and one-half miles north of Elkhart, Morton County, Kansas. On the following day, he shot a second pewee there, an adult male (KU 45640). The left testis was enlarged to 7 mm, and the bird had little fat. An adult female (KU 45641), ovary inactive, with little fat, was taken by Barlow also on 8 June 1964, along the Cimarron River at Wagon Box Springs, 12 miles south of Ulysses, Grant County, Kansas. James D. Rising shot two more pewees in the locality near Elkhart on 11 July 1964. These were a moderately fat adult male (KU 45568), left testis 7×5 mm and regressing, and a moderately fat adult female (KU 45567), ovary with at least one ruptured follicle and regressing. In 1927, William H. Burt took a female pewee (KU 16626) in Morton County on 6 July, and in 1957 Norman L. Ford collected two pewees seven and one-half miles north of Elkhart, Morton County, on 6 August. These were, female (KU 34187), ovary inactive, with heavy fat, and male (KU 34189), left testis 2 mm, with heavy fat. Although the eight specimens from Morton and Grant counties probably are representatives of breeding populations there, only the two birds taken on 11 July 1964, were unquestionably breeding. Both of these were shot from the same tree, and they seemed to be paired; the female (KU 45567) resembles *C. virens* in coloration, and the male (KU 45568) resembles *C. sordidulus*. None of the birds taken in southwestern Kansas was heard singing.

C. virens and *C. sordidulus* are morphologically difficult to distinguish. *C. virens* tends to be more olive-green on the back and crown (often dark olive-brown or brown in *C. sordidulus*), more whitish on the throat and chest (often gray, and much reduced in *C. sordidulus*), yellowish on the belly, with lighter feathers extending anteriorly in a mid-ventral line onto the breast, and yellowish on the under tail coverts (generally gray with brown splotches in *C. sordidulus*). The lower mandible is commonly pale yellow in *C. virens* and pale brown in *C. sordidulus*. These characters, taken collectively, generally separate the two species; based on these, KU 16626, 34187, and 45567 are referable to *C. virens*, and KU 34189, 45568, 45639, 45640, and 45641 are referable to *C. sordidulus*.

Johnston (The breeding birds of Kansas, The Univ. Kansas Mus. Nat. Hist., 14: 625) gives breeding records of *C. virens* in Kansas from 1 June to 20 July, with the modal date of clutch completion being 15 June. Using these temporal criteria to separate breeding from non-breeding birds, we measured 20 breeding male and 10 breeding female *C. virens* taken (28 May to 8 August) in eastern Kansas, and nine breeding male and nine breeding female *C. sordidulus* taken (17 June to 19 July) in New Mexico. Wing length seems to show reasonable consistent specific differences (tarsus, tail length, and the length and width of the culmen do not seem to differ consistently), and these measurements, along with those of eight birds taken from southwestern Kansas, are summarized in Table 1. Based on wing length, only KU

TABLE 1
WING LENGTHS OF WOOD PEWEES

| | Wing Chord (Males) | | | Wing Chord (Females) | | |
|---|------------------------|------|-------------------|------------------------|------|-------------------|
| | Range | Mean | S.D. ⁵ | Range | Mean | S.D. ⁵ |
| <i>Contopus virens</i> (Eastern Kansas) | 77.5-85.5 ¹ | 82.5 | 2.5 | 74.6-81.1 ² | 78.6 | 1.3 |
| <i>Contopus sordidulus</i> (New Mexico) | 82.2-88.1 ³ | 86.3 | 1.8 | 79.5-87.6 ³ | 83.3 | 2.8 |
| <i>Contopus</i> (Southwestern Kansas) | 80.2-88.7 ⁴ | 86.1 | - | 80.4-84.2 ⁴ | 81.8 | - |

¹N = 20; ²N = 10; ³N = 9; ⁴N = 4; ⁵ Standard Deviation.

34187 is clearly referable to *C. virens*; KU 34189 and 45641 are intermediate, but close to *C. sordidulus*; and KU 16626, 45567, 45568, 45630, and 45640 can be referred to *C. sordidulus*.

The colors suggest that the southwestern Kansas birds, considered as a population, are intermediate between *C. sordidulus* from New Mexico and *C. virens* from eastern Kansas. The analysis was based on spectral reflectance curves, determined by use of a colorimeter operating at five wave lengths (415, 475, 535, 595, 655 m μ).

Thus our eight specimens and associated field observations suggest that both *C. virens* and *C. sordidulus* breed in Morton and Grant counties, Kansas. Moreover, in spite of the apparent rarity of pure *C. virens* there, the two species probably interbreed with one another. This assumption is based partly on the generally intermediate morphology of the sample, but the following points should also be noted: the close resemblance in both morphology and behavior of the two species would enhance the chance of interbreeding, and the low density of *C. virens* in southwestern Kansas would make it likely that some individuals of this species would mate with *C. sordidulus*. JON C. BARLOW AND JAMES D. RISING, *Museum of Natural History, The University of Kansas, Lawrence, Kansas, 14 February 1965.*

Third Specimen of the Golden-winged Warbler for Kansas.—Johnston (Univ. Kansas Publ., Mus. Nat. Hist., Misc. Publ. 23, 1960:49) mentions the Golden-winged Warbler, *Vermivora chrysoptera*, as a rare transient in eastern Kansas and lists but two specimens, both from Douglas County. A search through more recent literature reveals no other specimen records.

On May 7, 1964, the writer came into possession of a male Golden-winged Warbler that had been found in a woodland in northeastern Wyandotte County, Kansas City, Kansas. The specimen was saved as a study skin and has been deposited in the Kansas City Kansas Junior College Collection.—DAVID A. EASTERLA, *Department of Biology, Kansas City Kansas Junior College, Kansas City, Kansas, November 17, 1964.*

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