MIGRATION OF LEAST AND TRAILL'S FLYCATCHERS IN WEST-CENTRAL KANSAS

By CHARLES A. ELY

Studies of the fall migration of the Least Flycatcher (*Empidonax minimus*) were recently made at three mist-netting stations in northeastern North America. Except for two adults (post-breeding stragglers) Phillips, *et al.* (1966) recorded only immatures in migration on Long Island, New York. Hussel, *et al.* (1967) at Long Point, Ontario noted different fall migration periods for adult and immature birds with adults preceding the immatures in migration. Clench (1969), however, found no age differential in the *E. minimus* migrating through southwestern Pennsylvania. She postulated that immatures migrate through the eastern United States at about the same time, whereas adults are concentrated inland with those migrating down the Allegheny Mountains appearing a month later than those migrating through lower country. With these observations in mind I have analyzed data obtained at a similar station located near Hays, Kansas, over 1000 miles to the west and somewhat south of previous study areas.

Hays is located in Ellis county at 38° 50′ N, 99° 20′ W in the mixed grass prairie association of the High Plains. The area is dominated by mixed grass prairie and cultivated land with tree growth occurring primarily along water courses and gullies and in plantings on farms, in windbreaks and in towns. Migrating Empidonaces are generally confined to these wooded habitats although *E. minimus* may also occur in tall weed growth and in isolated trees. The mist-netting station is on Big Creek near the Fort Hays Kansas State College campus and samples a small area of riparian habitat. It was in nearly continuous operation during all migration seasons from fall 1966 through fall 1969. Bird migration through the area is generally light and numbers do not approach those of many east coast Operation Recovery stations. Only during periods of adverse weather in spring (usually east winds, rain and heavily overcast skies) do heavy concentrations of migrants occur. As a result my sample sizes are small (152 birds during three years of netting). As might be expected, migration of *E. minimus* in an area of low density differed in several respects from more eastern localities.

All birds were identified by means of the characters given by Phillips, *et al.* (1966). The few questionable birds and representatives of different plumages were preserved as study skins. In fall all banded birds were aged by skull ossification and by plumage characters. Specimens were sexed by dissection and most banded birds were sexed by wing length, again according to the Phillips techniques.

LEAST FLYCATCHER — FALL MIGRATION

E. minimus is a regular but uncommon fall transient through west-central Kansas. Migration is early and adults probably start leaving the breeding grounds soon after their individual nestings are terminated. Extreme dates of confirmed observations (based on 10 specimens and 21 banded birds) are 16 July and 24 September with one straggler on 18 October. Sutton (1967: 344-345) records comparable dates for Oklahoma with specimens taken between 16 July and 8 October and the height of migration in September. The Kansas departure dates (5-24 September, mode 17 September) given by Johnston (1965) are misleading because they do not include "summer" records which are almost certainly early fall transients. Collection dates of all but one (6 July) of the Kansas specimens at the University of Kansas Museum of Natural History fall within the migration period observed at Hays.

Sutton (1967) reported no confirmed nesting record for Oklahoma and I know of none for Kansas. Since the known breeding populations nearest Hays are in southwestern South Dakota and possibly (but doubtfully) northeastern Kansas (AOU, 1957) all Hays birds are presumed to be transients. The small number of repeats (7 of 121 spring birds), all netted within a few days of first banding, also supports this view. Nearly all of the 1969 fall adults had traces of body molt, usually on breast, flanks or tail coverts.

The fall migration at Hays was gradual, without noticeable peaks, but sightings were clumped with periods during which no birds were present. This lack of a definite peak may be due to the low density of the migration. When all sightings for the three seasons are lumped a strong differential migration is noted with respect to age (Table 1). As at Long Point adults definitely migrate earlier than do immatures.

The Hays sample differs markedly from other studies in the high incidence of adults present. Over 50% of all birds (18 of 31) were adults as compared to about 21% in southwestern Pennsylvania (82 of 391) and about 26% at Long Point (48 of 182). This supports the belief of Clench that migrating adults may be concentrated inland. Studies at other interior localities would be very interesting.

Phillips, *et al.* reported a nearly 1:1 sex ratio with no differential migration between the sexes. The small Hays series is comparable.

LEAST FLYCATCHER — SPRING MIGRATION

Spring migration of *E. minimus* has apparently not been studied in detail. At Hays it is a common spring transient with confirmed observations between 2 and 26 May. Sutton (1967: 344-345) gives 20 April as the earliest spring arrival for Oklahoma and reports specimens taken through 18 May. A bird recorded 23 June could have been either a straggling spring transient or a very early fall arrival. Johnston (1965) gives similar Kansas arrival dates of 20 April through 15 May but omits early "summer" records. Most of

TABLE 1. AGE DISTRIBUTION OF FALL *E. minimus* BY ACTUAL DATE OF OCCURRENCE AT HAYS, KANSAS

	July							August								September					October	
	16	23	24	25	26	28	30	2	3	4	5	8	15	16	23	10	18	22	23	24	18	Totals
Adult	1	1	2	2	1	1	1		1	1	1	3	1		2							18
Immature													3	2		1	1	1	1	1	1	11
Not aged								2														2
Totals	1	1	2	2	1	1	1	2	1	1	1	3	4	2	2	1	1	1	1	1	1	31

TABLE 2. NUMBERS OF SPRING MIGRANT (MAY) LEAST FLYCATCHERS HANDLED AT HAYS, KANSAS

Year	May																								
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Totals
1967	8	2	3	1	4	4	3		2	1				1		2	1	3	2						37
1968		1	1				3	1			2	7	4	2	4	2						5	13	5	50
1969				1	3	4		3	2	2	3						3	5	3		1	4			34
Totals	8	3	4	2	7	8	6	4	4	3	5	7	4	3	4	4	4	8	5		1	9	13	5	121

TABLE 3. PROBABLE SEXES OF SPRING TRANSIENT LEAST FLYCATCHERS HANDLED AT HAYS, KANSAS

	Four-day periods during May						
Sex	3-6	7-10	11-14	15-18	19-22	23-26	Totals
Males	11	23	13	7	6	12	72
Females	2	2	3	7	11	14	39
Totals	13	25	16	14	17	26	111

his records are from extreme eastern Kansas.

A total of 121 birds (116 bandings and 5 specimens) were handled at Hays during three seasons. The migration was bimodal during each season (Table 2) with the peaks varying somewhat from year to year. This pattern is lost, however, when the three seasons are combined for further analysis. Perhaps weather is responsible for much of this variation.

Most birds were sexed and were then grouped by four-day intervals (Table 3). A differential migration seems to be indicated with most males passing through the area earlier than females. Furthermore the sex ratio is nearly 2:1 in favor of males. A study of spring sex ratios at other inland stations would be very interesting.

TRAILL'S FLYCATCHER MIGRATION

The only other *Empidonax* migrating regularly through the Hays area, *E. trailli*, has a migration pattern differing from that of *E. minimus* in several respects. *E. trailli* has a more extended spring migration period with confirmed records from 12 May through 12 June. However, some 87% of our 115 confirmed records (97 bandings and 18 specimens) are limited to the brief period 20-25 May. Spring arrival dates of 19-25 May given for Kansas (chiefly extreme eastern Kansas) by Johnston (1965) are similar and Sutton (1967: 342) while giving an early arrival date of 20 April also notes a "heavy" movement in late May and the first few days of June. Since the species nests in eastern Oklahoma and eastern Kansas late spring transients there are not easily distinguished. It does not breed in west-central Kansas, however.

The magnitude of the spring migration at Hays is apparently dependent on local weather conditions during the peak migration period. Low numbers are recorded when fair weather occurs during this period but much higher numbers are present when inclement weather occurs. During 1969 a period of heavily overcast skies, light rain and east winds combined to produce the largest numbers recorded to date. For a brief period birds were conspicuous in town and in all riparian habitats visited and even outnumbered *minimus* at the banding station.

During the fall migration at Hays *E. trailli* is again less common than *E. minimus*. Scattered confirmed records (12 specimens and 8 bandings) are from 23 July to 12 September with a minor peak during mid-August. Johnston (1965) gives the autumnal departure dates for Kansas as 14 August to 24 September. In Oklahoma, Sutton (1967) states that adults begin migrating in early August and records specimens to 19 September. His few data suggest (as does a statement by Hussell, *et al.* (1967)) that adults may precede immatures in the fall migration. My few data agree since five of seven adults were collected by 16 August, the first date on which an immature was taken.

On Long Island, Phillips *et al.* (1966) found that males outnumbered females by 2:1 but with no indication of a differential

migration pattern between the sexes. Attempts to sex the Hays sample by the Phillips technique were unsuccessful probably because the sample (both spring and fall birds) included both *E. trailli* and several races of *E. "brewsteri."*. Among the few birds heard singing during May were individuals of both song types.

CONCLUSIONS

The migrations of Least and Traill's Flycatchers were studied at a mist-netting station in west-central Kansas where both are regular but low-density transients. A total of 152 *Empidonax minimus* and 135 *E. trailli* were handled during three years.

Fall migration of *minimus* was gradual, without pronounced peaks and extended from 16 July to 24 September with a straggler on 18 October. A differential migration was noted with adults preceding the immatures. The high percentage (over 50%) of adults in the sample supports previous suggestions that adults are concentrated inland during migration.

Spring migration of *minimus* was bimodal with different peaks in different years and with extreme dates of 2 and 26 May. The sex ratio was nearly 2:1 in favor of males and most males migrated earlier than females.

Fall migration of *E. trailli* extended from 23 July to 12 September with a small peak in mid-August. In spring extreme dates were 12 May through 12 June but 87% of all birds were recorded during the period 20-25 May. In spring numbers are largest when inclement weather coincides with this main migration period.

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BANDING THE TWO SONGFORMS OF TRAILL'S FLYCATCHER

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INTRODUCTION

Due to their morphological similarity the flycatcher populations included under the name *Empidonax traillii* have long confused systematists. My field study over three years at Litchfield, Connecticut, indicates that the two songforms ("fitz-bew"s and "fee-bee-o"s) of Traill's Flycatcher do not interbreed when sympatric. The present report summarizes my banding program and provides new and more direct evidence for reproductive isolation between the songforms (see Stein, 1963, for citations of earlier studies on these songforms).

PROCEDURES

Habitat, behavior and natural history of Traill's Flycatchers were studied primarily on the grounds of the White Memorial Foundation in Litchfield, Connecticut. Enders and Magee (1965) reported populations of both songforms ("fitz-bew"s and "fee-bee-o"s) at the mouth of the Bantam River inlet at Bantam Lake in Litchfield. A second area containing numerous individuals of the two songforms surrounded Little Pond on the Bantam River about 4.8 kilometers north of its entrance into Bantam Lake. I chose this latter site for intensive study in view of the presence of larger populations as well as easier accessibility.

Adults were caught with either mist or hoop nets. Capture by mist net was facilitated by playing tape recordings of the advertising song of the songform at hand. Experience showed that the efficiency of capture increased.

Many Traill's were banded with standard metal bands and plastic color bands on opposite legs. For "fitz-bew"s red leg bands were placed on the left leg of females and on the right leg for males. Yellow bands were used in the same way for captured "fee-bee-o"s. The present study is a report on the banding program which greatly facilitated the interpretation of the behavioral observations and provided more accurate data on the natural history of the songforms.