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THE SUBSPECIES AND ECOLOGY OF MEADOWLARKS
IN NORTHEASTERN ARKANSASRobert Lowery and Earl L. Hanebrink
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INTRODUCTION

The objectives of this study were to: (1) determine the status of the eastern and southern subspecies of meadowlarks in northeastern Arkansas: *Sturnella magna magna* and *Sturnella magna argutula* respectively, (2) determine the status of the western meadowlark *Sturnella neglecta neglecta*, and (3) compare the habitat preference and relative abundance of meadowlark species on Crowley's Ridge with that of the adjacent western delta region.

Although statements have appeared in the past literature concerning the status of the meadowlarks in the northern part of Arkansas, some were found conflicting and others were based on sight observations and not on prepared skins. The findings of Howell (1911) indicate that *Sturnella magna magna* does not breed in Arkansas, although his conclusions were based upon specimens taken only from Blytheville, Stuttgart, Conway, and near Mammoth Springs. All of the specimens were identified as *Sturnella magna argutula*. Pindar (1924) relates that the eastern meadowlark was common in Phillips County, Arkansas but rare in the more northern Poinsett County during the fall and winter of 1888-89. This was by inference and not actually determined by examination of specimens. Wheeler (1924) states that *Sturnella magna magna* breeds in Arkansas, thinking that he was quoting Howell's findings and not realizing that he had mis-read Howell. Wheeler was puzzled by Howell's phrase "exclusive of the "Ozarks" and substituted the words "mountainous area" for "Ozark Region". Wheeler simply erred through misinterpretation. He thought *Sturnella magna argutula* was confined to parts of Arkansas south of the ozarks and his range map for this form indicates as such. However, Wheeler contradicts his range map in his written description of the range of *Sturnella magna argutula*. Black (1935) considers all breeding meadowlarks in the Winslow Region of the Ozark Mountains to be *Sturnella magna argutula* but comments that they were "radically" different from specimens collected 50 miles south. Although suggesting an area of sympatric distribution for the two subspecies, Black still considered the meadowlarks in the area more closely related to *Sturnella magna argutula* than to *Sturnella magna magna*. Deaderick (1935) from sight observations includes *Sturnella magna argutula* in his preliminary list of birds for Hot Springs, Arkansas, and states its status as a common permanent resident but less common during the winter months. He found the western meadowlark *Sturnella neglecta neglecta* a "rare transient" in the Hot Springs area. Baerg (1951) mentions that *Sturnella magna magna* is

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not known definitely to nest in the state but could probably nest in the Ozark Mountains of Arkansas. Collins (1960) records one western meadowlark *Sturnella neglecta neglecta* in her study of birds in north-eastern Arkansas. Hanebrink (1965) found the western meadowlark a transient and not common in that area. James and James (1964) record the western meadowlark from October 18 as the earliest fall date until April 30 as the last spring date for the state while indicating the eastern meadowlark a permanent resident. From an ecological standpoint, Grinnell (1927) states the western and eastern meadowlarks differ in their tolerance of humidity. In areas where sympatric distribution occurs, the western subspecies favors the drier hillsides and the eastern subspecies the moist swales below; however, the two species may come into contact and live side by side. Ecological aspects of the sympatric distribution of meadowlarks in the north-central states as well as territoriality have been discussed by Lanyon (1956a, 1956b, and 1962). Hybridization of the eastern and western species has been reported by Sutton and Dickson (1965), and Lanyon (1966).

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METHODS

The method of field observations employed in taking bird censuses in each of the two habitat types was to identify each bird to species by either sight or sound. Care was taken not to cover the same ground and record the same bird twice. Neither the route traversed nor the time spent in the habitat type was constant, but the majority of counts were made during the morning hours. The one hour unit of time remained constant, however, so that comparisons could be made. In recording information for this study, a field sheet was used which included information on the location, habitat type, date, time, temperature, weather conditions, mileage, and number of meadowlarks observed.

The second method used in this study was the roadside census first used by Nice and Nice (1921) to measure bird populations of Oklahoma in 1920. Since then it has been used by a number of other workers. Kendeigh (1944) evaluated the roadside census in relation to other types of censuses. Howell (1951) used the roadside census method as a means of measuring bird populations in Tennessee. The roadside census in this study was employed as a method of determining relative abundance and not absolute abundance. The roadside counts were conducted on secondary roads in two major habitat types: namely, Crowley's Ridge and the adjacent western delta farm areas. The automobile was driven between 15 and 20 miles per hour, and meadowlarks

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were recorded as they appeared before the observer. Field glasses of 7 x 50 power were used for all field and roadside census work.

To determine the subspecies composition of meadowlark populations, several specimens were taken periodically throughout the year in the study area and identified by a recognized authority. Specimens were taken with a twelve-gauge shotgun using a light-load cartridge. Care was taken so that the birds would not be damaged beyond recognition. As the skins were prepared for identification, each specimen was assigned a field number. Information concerning the habitat from which collected, the date, and the sex were recorded for each specimen and placed on a card which was attached to the individual prepared skin.

RESULTS AND DISCUSSION

Fourteen meadowlarks were collected, skins prepared, identified, and placed in the Arkansas State University Museum (Table 1). Six of the birds were identified as *Sturnella magna magna* apparently having come down from breeding populations to the north, as all were collected during the fall, winter and early spring in the study area. Numbers 1, 2, 4, 6, and 11 were males, and number 3 was a female.

Two birds of the total collected were identified as western meadowlarks *Sturnella neglecta neglecta* presumably from breeding populations to the north or northwest of this area. Specimen number 13 was identified as a first-year female collected on February 14, and the specimen number 12 was identified as a first-year male. James and James (1964) record October 18 as the earliest fall date for the occurrence of the western meadowlark. Specimen number 12 was taken from the Crowley's Ridge habitat on October 16; therefore, it extended the previously known record for its occurrence by two days. The latest spring date recorded for Arkansas was April 30 for the western meadowlark. This record can now be extended to May 21 as a western meadowlark was heard and seen singing for several hours on this date at Jonesboro in 1966.

The remaining specimens collected during the breeding season from local populations, or at least from some locality not far north of this area, were assigned to *Sturnella magna argutula*. Number 14 is a juvenile closer to the southern subspecies than to *Sturnella magna magna*. Numbers 5, 7, 9, and 10 are males, intermediate in size and coloration but more closely related to *Sturnella magna argutula*. Number 8 is a female, again intermediate, but closer to the southern form. Apparently, the breeding birds become larger and somewhat lighter in plumage not far to the north of this area. Northeastern Arkansas appears to be close to the shift from *Sturnella magna magna* to *Sturnella magna argutula* (Lanyon, 1966, personal communication).

Field and roadside observations indicate a greater relative abundance of meadowlark species on Crowley's Ridge (Tables II — V) than on the delta during the spring and summer. During the fall and

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winter the converse of this occurred. Chi square analysis of the censuses showed that these population differences were highly significant. This seasonal habitat preference could possibly correlate with the shift from the breeding *Sturnella magna argutula* population to the over-wintering *Sturnella magna magna* population from the north.

The western meadowlark *Sturnella neglecta neglecta* appeared only as a rare winter resident or transient and was not common in the study area at any time. The extreme dates for the western meadowlark ranges from October 16 to May 21. This species can be identified by its voice in the field. The extend of yellow on the cheek, amount of white on the rectrices, and the general lighter coloration of the crown and back are useful and reliable in identifying the western species from the other forms (Lanyon, 1966). Findings indicate that a decided preference was shown by the western species in its habitat preference. Nine western meadowlarks were identified by voice during the study, and all were associated with feed-lots on Crowley's Ridge.

Table I

Meadowlarks collected in northeastern Arkansas

Field No.	Sub-species	Sex	Collected Habitat	Date
1	<i>Sturnella m. magna</i>	Male	Crowley's Ridge	Nov. 13, 1965
2	<i>Sturnella m. magna</i>	Male	Delta	Dec. 18, 1965
3	<i>Sturnella m. magna</i>	Female	Delta	Jan. 8, 1966
4	<i>Sturnella m. magna</i>	Male	Crowley's Ridge	Feb. 2, 1966
5	<i>Sturnella m. argutula</i>	Male	Crowley's Ridge	Mar. 20, 1966
6	<i>Sturnella m. magna</i>	Male	Delta	Apr. 6, 1966
7	<i>Sturnella m. argutula</i>	Male	Delta	May 7, 1966
8	<i>Sturnella m. argutula</i>	Female	Crowley's Ridge	June 12, 1966
9	<i>Sturnella m. argutula</i>	Male	Delta	July 10, 1966
10	<i>Sturnella m. argutula</i>	Male	Crowley's Ridge	Aug. 13, 1966
11	<i>Sturnella m. magna</i>	Male	Crowley's Ridge	Sept. 18, 1966
12	<i>Sturnella n. neglecta</i>	Male	Crowley's Ridge	Oct. 16, 1966
13	<i>Sturnella n. neglecta</i>	Female	Crowley's Ridge	Feb. 14, 1965
14	<i>Sturnella m. argutula</i>	Juvenile	Delta	July 7, 1966

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Table II

Comparison of Meadowlark Populations Based on Roadside Censuses
(Fall and Winter)

Habitat Types	No. of Individual Trips	Total Miles	Ave. No. of Birds Per Mile	Total No. of Birds
Crowley's Ridge	20	382	0.56	212
Delta Area	20	340	0.74	250

Table III

Comparison of Meadowlark Populations Based on Roadside Censuses
(Spring and Summer)

Habitat Types	No. of Individual Trips	Total Miles	Ave. No. of Birds Per Mile	Total No. of Birds
Crowley's Ridge	20	386	1.18	456
Delta Area	20	340	0.45	153

Table IV

Comparison of Meadowlark Populations Based on Field Censuses
(Fall and Winter)

Habitat Types	Total Hours in Field	Ave. No. Birds Per Hour	Total No. of Birds
Crowley's Ridge	10	34.60	346
Delta Area	10	45.30	453

Table V

Comparison of Meadowlark Populations Based on Field Censuses
(Spring and Summer)

Habitat Types	Total Hours in Field	Ave. No. Birds Per Hour	Total No. of Birds
Crowley's Ridge	10	36.80	368
Delta Area	10	25.50	255

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SUMMARY

Fourteen meadowlarks were collected from different months of the year, and skins were prepared and placed in the Arkansas State University Museum.

Census work was conducted in three counties of northeastern Arkansas, and comparisons were made in two unlike habitat types both by means of numbers recorded per hour of field observations and by conducting roadside censuses in two unlike habitat types comparing numbers of meadowlarks seen per mile.

Finding from a limited study indicate that the subspecies of meadowlarks nesting in this area are *Sturnella magna argutula* which are intermediate in form but more closely identifiable to *Sturnella magna argutula*. The wintering population is a different group of birds presumably nesting to the north of this area and are of the subspecies *Sturnella magna magna*. The western meadowlark *Sturnella neglecta neglecta* appears only as a transient or rare winter resident.

The records of the state have been extended for the western meadowlark from October 16 to May 21. The western meadowlark *Sturnella neglecta neglecta* can best be identified in the field by its voice.

Findings indicate a greater relative abundance of meadowlark species on Crowley's Ridge during the spring and summer with greater numbers occurring in the delta area during the fall and winter. Using 2 x 2 contingency tables the field census data yields a chi square value of 34.80 and the roadside census a chi square of 93.58. The probability is less than 0.001 that these chi square values will obtain with no real population differences. Thus, in both cases there is a significant difference between the populations occurring in different areas at different seasons. This seasonal habitat preference seems to correlate with a shift from breeding of *Sturnella magna argutula* in summer to the over-wintering *Sturnella magna magna* population from the north.

There is a decided preference shown by the western meadowlark to the drier ridges associated with feed-lots within the study area.

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