



12-31-1942

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Robert W. Hiatt
Montana State College

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Recommended Citation

Hiatt, Robert W. (1942) "A frequency distribution of Eastern and Western Kingbirds in Montana," *Great Basin Naturalist*: Vol. 3 : No. 3 , Article 4.

Available at: <https://scholarsarchive.byu.edu/gbn/vol3/iss3/4>

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A FREQUENCY DISTRIBUTION OF EASTERN AND WESTERN KINGBIRDS IN MONTANA

ROBERT W. HIATT
Assistant Professor of Zoology
Montana State College

Summer travelers on the automobile roads of Montana who are cognizant of bird species quickly become impressed by the relatively great populations of both the eastern kingbird (*Tyrannus tyrannus*) and the western or Arkansas kingbird (*Tyrannus verticalis*). The well known preference of kingbirds to select wire fences and power lines for perching enables an observer to record virtually all the birds in a sizable area. This is especially true in Montana where open ranges are common, with fences usually placed along the highways. Power lines are few and likewise generally located along the main arteries for travel. It is, therefore, reasonable to assume that data recorded by qualified observers should provide an accurate index to the distribution and relative abundance of these species in this State.

The present investigation was conducted incidental to a larger project which involved traveling over almost the entire State of Montana, the itinerary including, in addition to main highways, many roads of secondary importance. Two observers riding in the front seat of an automobile tallied the birds. One observer covered the fences and electric wires on one side of the highway, while the second observer similarly covered the opposite side of the road. Terrain types were selected as the basis for establishing the origin and conclusion of a single tally period, i. e., each time a major ecological change occurred a new tally recording was made. For this reason the distance for a single tally period was considerably greater in the relatively homogeneous areas of eastern Montana than in the mountainous region of the western one-third of the State (Plate I).

The data were recorded separately for the three major geomorphological regions. The main range of the Rocky Mountains crosses the western part of Montana in a northwest-southeast direction, dividing the State into two sections of unequal size. The western one-third is characterized by rugged mountains and narrow valleys, while the east conforms largely to the Great Plains type of country, broken occasionally by wide river valleys and isolated groups of mountains.

These varied topographic conditions exert a sufficient effect on the distribution and frequency of the tyrannids to require individual tabulation and interpretation of results.

A total of 2,370 miles were driven which enabled the writer to make recordings over virtually the entire State. Table I and Plate 1 serve to summarize the results of this study.

It is immediately obvious that both species occur widely throughout the State but least frequent in the mountains to the west. However, the heaviest concentration of eastern kingbirds in the State occurred in one of the canyons prairies in the mountainous regions west of Ronan where one bird per mile for 55 miles was recorded. Similarly, immediately north of Missoula in a narrow mountain valley both species occurred abundantly. It is interesting to note that in this localized area, which is approximately 4000 feet in elevation, is virtually the only population of western kingbirds in the mountainous region. It seems apparent that they are restricted by high altitudes east of Missoula, and perhaps by narrow valleys west of this point, although the valley floors are below 4000 feet in elevation. The eastern kingbird is common in the mountains where small valleys below 6000 feet occur.

Both species are considerably more abundant in the prairie regions between the large river valleys to the east. The eastern kingbird is approximately three times as abundant as the western kingbird. However, in the more arid regions (in the vicinity of Jordan) receiving less than 13 inches of precipitation yearly, the western kingbird outnumbered the eastern by ten to one.

The extensive river valleys and irrigated benches of the Yellowstone, Missouri, and Milk rivers support the greatest concentration of tyrannids in the State. In these regions the eastern kingbirds outnumber the western species almost two to one. The Yellowstone River Valley, particularly in the vicinity of Billings, seems to provide near optimum environmental conditions for both species. Irrigated lands extending several miles on either side of the Yellowstone River support a considerable number of trees, mainly cottonwoods and willows. The ditch banks provide an area where brushy types are abundant. It has been pointed out by Bent (1942) that the western kingbird prefers to nest in trees, where suitable types are available. There is little doubt that these trees serve as an important ecological constituent which enables the area to support the dense populations found there. Western kingbirds dominate areas where trees are in groves or grouped in small areas, i. e., in towns and around farm buildings.

TABLE I
 Analysis of frequency distribution of kingbirds in the three main geomorphological types of Montana

Species	Mountain Terrain			Prairie Terrain			River Valley Terrain			State Totals		
	Number tallied	Number miles driven	Miles driven per bird observed	Number tallied	Number miles driven	Miles driven per bird observed	Number tallied	Number miles driven	Miles driven per bird observed	Number tallied	Number miles driven	Miles driven per bird observed
<i>T. tyrannus</i>	45	604	13.4	196	960	4.9	245	806	3.3	485	2,370	4.9
<i>T. verticalis</i>	17	604	35.5	58	960	16.5	136	806	5.9	211	2,370	11.2

Eastern kingbirds seem to prefer the more open habitats where brush, not trees, dominates the landscape.

Between the irrigated valleys, trees give way to brushy types which are located rather sparsely in draws and coulees. In one such region between Miles City and Jordan a comparatively great population of western kingbirds was found. Trees are virtually absent, scattered brushy areas provide the only nesting sites for this species. Insect food which constitutes the major portion of the diet (Bendire, 1895; Bent, 1942) is plentiful on the prairies. An adequate food supply may compensate for the less desirable nesting sites in these localities. It is apparent, however, that this species is capable of adapting its nesting activities to a variety of sites. In the southern Prairie Provinces of Canada western kingbirds apparently require the presence of trees (Taverner, 1934). It is to be expected that this species would be represented in rather sparse numbers at the northern limit of the breeding range. The reduction in nesting site competition would thereby enable all the birds present to utilize trees to the virtual exclusion of less select sites. However, farther south toward the center of the breeding range, intraspecific competition for the few trees available undoubtedly necessitates the selection of more varied nesting situations by many birds.

SUMMARY

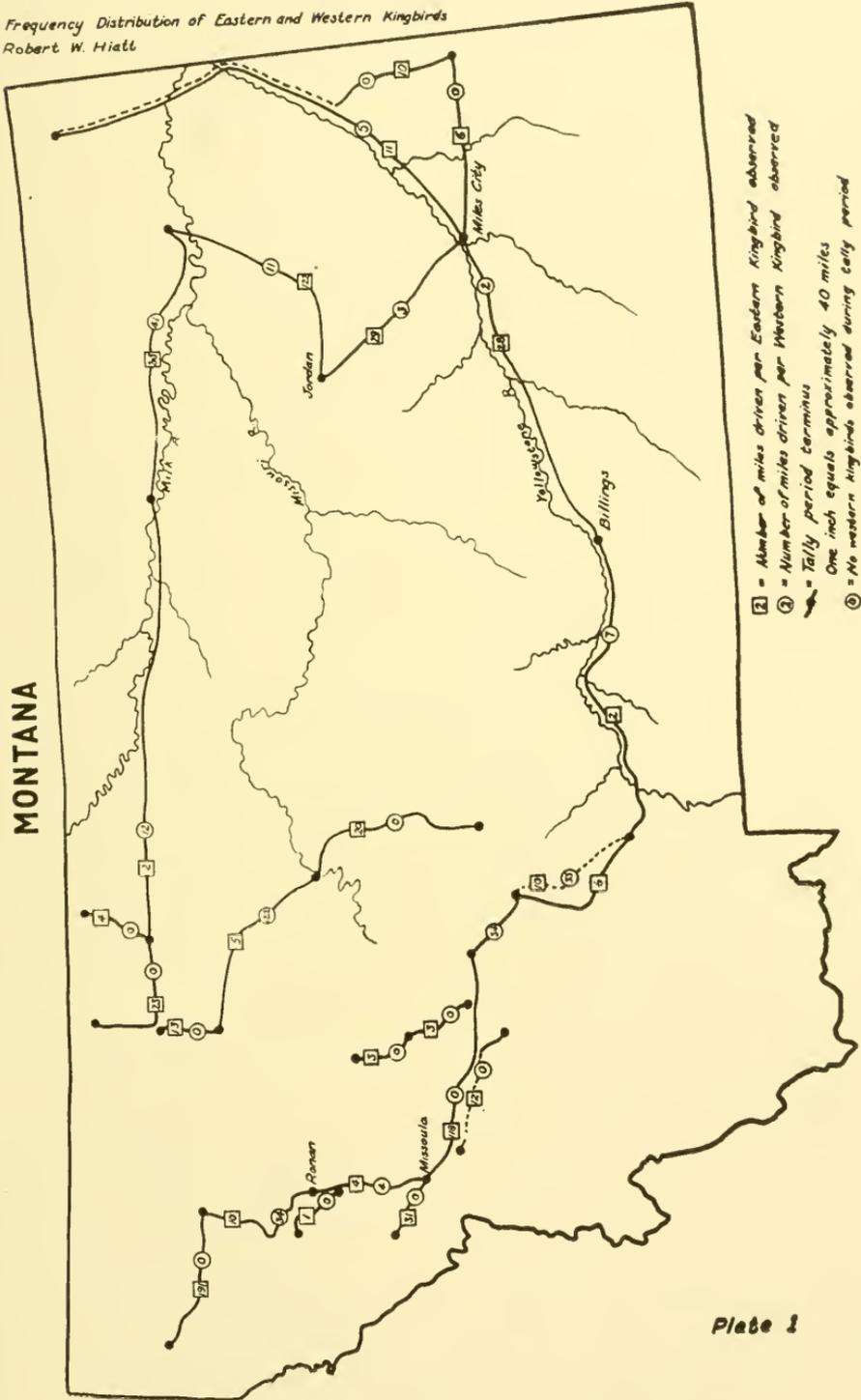
The habits and abundance of the eastern and western kingbirds make possible studies in distribution and density by the relatively simple method of road tallying.

Both species occur widely throughout the State with greatest concentrations along the river valleys to the east.

The eastern kingbird is approximately twice as common as the western species, the latter apparently restricted by elevations in excess of 4000 feet in the northwest and 5000 feet in the south. In extremely dry areas, the western kingbird is common to the near exclusion of its eastern relative.

Eastern kingbirds occur on a statewide average about one bird to each five miles driven, while the western kingbird is to be encountered approximately once in eleven miles.

Frequency Distribution of Eastern and Western Kingbirds
Robert W. Hiatt



- ② = Number of miles driven per Eastern Kingbird observed
- ④ = Number of miles driven per Western Kingbird observed
- = Tally period terminus
- One inch equals approximately 40 miles
- = No western kingbirds observed during tally period

Plate 1

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PLATE I

Map showing frequency distribution of eastern and western kingbirds in Montana during the summer, 1942. The numerals indicate the number of miles driven for each bird observed (see legend). Where recording areas overlap an adjacent census line (dotted) is placed parallel to the highway.