

BIRD STUDY PROBLEMS OF CENTRAL EASTERN SOUTH DAKOTA

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The purpose of this paper is to present some problems of bird study in central eastern South Dakota and to suggest to residents of this area some studies which might help to solve these problems.

First, let me give the physiographic features of the area which I have called central eastern South Dakota. It covers a block of ten counties in the eastern part of the state and is bounded on the west by the James River, Sioux Falls on the south, the South Dakota border on the east, and Watertown on the north. The map shows¹ the *Central Lowlands*, divided into the *Prairie Hills Division* and the *James Basin Division*. The *Prairie Hills Division* is further divided into the *Old Drifts Section* (east of Big Sioux River) and the *Lake Section* on both sides of this glacial moraine which runs almost due north. The top of this moraine is 1800 feet above sea level and is the highest elevation of the area.

The *Old Drifts Section* in the east has been long exposed to the action of wind and streams, and Minnehaha County is seamed with many valleys. Farther north the valleys have been partly covered with a veneer of glacial drift called the Iowan Drift left by the second great ice sheet. Old stream valleys are still visible as broad shallow depressions, all leading to the main drainage, the Big Sioux River.

The land west of the drifts area is dotted with lakes, and therefore is called the Lake Section. Most of these lakes are spring fed and are drained by an outlet. These fresh water lakes afford a splendid habitat for fish, game, and water fowl.

The left bank of the middle third of the James River, which includes the highlands west of the 1800 foot moraine and the flood plains to the river, is also part of this area. The roughness of much of the surface is due to the drift of 50 feet or more in thickness left by the last, or Wisconsin, ice sheet.

The vegetation of this area is mainly prairie, treeless except along streams or around lakes. There are a few prairie groves which

¹Rothrock; see bibliography.

usually fringe the lakes or streams and are mainly dominated by bur oak trees (*Quercus macrocarpa*). Sometimes they become straggling scrub growth out in the prairie.

'Bottom land forests' are dominated by willows (*Salix*), cottonwoods (*Populus deltoides*), box elders (*Acer negundo*), and in some ash (*Fraxinus pennsylvanica lanceolata*) and American elm (*Ulmus americana*) are fairly constant.

Prairie shrubs form characteristic clumps in ravines on less exposed slopes and occasionally are scattered in the open prairie. Snowberry (*Symphoricarpos orbiculatus*), chokecherry (*Prunus virginiana*), and black current (*Ribes petiolure*) predominate.

Much of the prairie in this area is under cultivation or has been overgrazed, and only a few of the native grasses persist in scattered patches and along railroad right of ways. These are the big and little bluestem (*Andropogon furcatus* and *scorparius*), wild rye (*Elymus canadensis*), and needlegrass (*Stipa spartina*). Pastures are predominantly Kentucky bluegrass (*Poa pratensis*) which is not native. The prairie forbs have withstood the intrusion of foreign species better than the grasses. Our state flower (*Anemone patens*) can still be found on uncultivated hills. The Canadian wild flower (*Anemone canadensis*), prairie coneflower (*Ratibida columnaris*), prairie catspaw (*Antennaria neglecta*), wild rose (*Rosa multiflora*), and sage (*Salvia*) are found.

There is also a variety of wet land habitats depending on the depth of the water level. If the soil is water-logged and covered to a depth of six inches with water, the vegetation will include spike-rush (*Eleocharis palustris*), cattails (*Typha*), and pickleweed (*Pontederia*). Inland fresh marshes six to three feet deep produce bullrushes (*Scripus acutus*), and wild rice (*Zizania aquatica*). These constitute the best breeding habitats in the area and are also important feeding places for migratory birds, especially the diving ducks.

Deeper fresh water lakes supporting vegetation such as pondweed (*Potamogeton pectinatus*), duckweed (*Lemna minor*), and watermilfoil (*Myriophyllum verticillatum*) in plentiful amounts are used as feeding and resting areas for ducks, geese, and coots, especially during the migratory periods.

MIGRATORY STUDY PROBLEMS

Nationwide cooperative migratory studies are being made by Mr. James H. Zimmerman² and others who say they have all too

²"Cooperative Migratory Studies," 2114 Van Hise Ave., Madison 5, Wisconsin.

few cooperators in South Dakota. They want at least one observer in each county for both spring and fall migration studies. A list of selected species is sent and the observer is asked to report on their abundance, dates of arrival, and peak dates. The study's primary aim is to ascertain the role of weather in migration of birds.

Similar country-side studies have been undertaken by Lowery (1951) and Newmann (1952). The procedure is to make observations of migratory movements across the face of the moon with a telescope of at least 15 power. Instructions for such study can be obtained from the Museum of Zoology at the Louisiana State University where reports will be analyzed and published.

"A Laboratory and Field Manual of Ornithology"³ by Pettin-gill gives explicit directions on migratory studies. The effect of weather on migration and migratory waves and flights and flight lanes are appropriate for study in this area.

Despite the effects of weather on migration, migratory travel over a period of years is regular on the average. From my records of first arrival dates, I have estimated the peak dates for many spring migrants in the Madison area. There is much less regularity in arrival and departure of migrant species in the fall, and securing records is difficult. Further complications are caused because the birds usually do not sing in fall migration and sometimes their plumage is more inconspicuous.

Regularity of migrations over a period of years is also revealed in "migratory waves." Spring brings the first wave of hardy birds such as robins, meadowlarks, and black birds. About a month later the second wave, including flycatchers, vireos, warblers, and other insect-eating birds, comes.

There appear to be definite "flight lanes" in the migratory movements north or southward. Some species tend to favor certain topographic lanes in the central eastern area which I previously described: the Big Sioux River Valley, the north-south moraine, and the James Basin valley and river. There may be lake-to-lake lanes in the Lake Section and grove-to-grove lanes in the wooded areas. There may also be a dispersed migratory flight over the prairie where there are no definite lanes.

POPULATION DENSITY STUDIES

We can determine the population or the density of species occurring in a certain area by taking a breeding-bird census. It is

³3rd ed., Burgess Pub. Co., Minneapolis, Minn.

⁴South Dakota Bird Notes, 1956, Vol. VIII No. 2, pp. 25-6.

advisable to choose a typical area of not less than 15 acres. Directions for taking such a census will be sent to you free of charge by Audubon Field Notes⁶.

Fluctuation in population over a period of years can be measured by keeping accurate accounts of the species in question. An attempt to determine the cause of fluctuation should be made if possible. Maurice Anderson, a state Game and Wild Life Research Biologist from Madison, gave me some data on population fluctuation of duck density in the state. He said that the index of breeding duck density for the state in 1957 was 5.3 ducks per square mile, and in 1953 it was 13.6 ducks per square mile, almost three times 1957's density. He said there was a change in index of breeding anywhere from 10 to 250 per cent depending on the moisture content of the area. The water density index was 5 in 1957 and 7.4 in 1953.

Subsidized drainage has no doubt made great changes in breeding bird population. Physical factors such as air temperature, relative humidity, precipitation, and land uses by man may be causes. Biological factors such as predation, competition, conditions of vegetation, and abnormal sex ratio could also be factors. To keep correct data we must always view the suspected factors along with the bird population changes.

A Christmas census is also a possible problem. It would not be meant to be an accurate index on population levels, but a step in the direction of a continent-wide demonstration of unity and cooperation among those interested in birds. In Madison we get about the same twenty-three species in our Christmas census each year.

Avid bird-banders are invaluable help in solving all these problems. A few more good banders in our area who would be willing to set traps in untouched areas could give us data for both migration and population problems.

I will conclude by suggesting four problems: 1. Report the significant change in birdlife you have observed in your region. Get some figures, preferably over a number of years, and send your information to Dr. Herbert Krause⁶ who edits this material for *Audubon Field Notes*. 2. Make a breeding-bird census for an untouched area. More information is needed on prairie species of the Old Drifts Section, Lake Section, and the James River Basin. 3. Participate in the spring and fall migration studies, on dates of arrival, peak dates, and last dates and on the abundance of a selected number of migratory species. Send your results to James H. Zimmerman.

⁶1000 Fifth Avenue, New York City, N. Y.

⁶Augustana College, Sioux Falls, South Dakota.

4. Make a study of your own on population fluctuations of certain species in your area. Write your results and send to *South Dakota Bird Notes*.

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