

ORNITHOLOGICAL LITERATURE

ECOLOGY AND MANAGEMENT OF THE MOURNING DOVE, *Zenaidura macroura* (LINN.), IN CASS COUNTY, IOWA. By H. Elliott McClure. Agric. Exper. Sta. Iowa State College Research Bull. No. 310, 1943:355-415.

Thirty months were spent on the study reported in this bulletin: during 1938 and 1939 visits were made every other day to all nests on the 160 acres in Lewis, Cass County, Iowa, and on 60 acres on farms and other sites near Lewis; during 1940, nests on 10 acres in Lewis and 5.5 acres of farms were visited every day. In all, "nearly 4,000 nestings" were recorded. Bands were put on 1,643 young from 4 to 9 days old; some young were raised by hand; "several" of these later bred in cages.

Of the 36 tables in the bulletin, a full 10 are devoted to the trees in which the Mourning Dove nested; but they give little information beyond the fact that except for evergreens, which were especially favored, most of the trees "were used in accordance with their abundance" (p. 373). The Doves benefited from Robins as nesting neighbors because of the latter's aggressiveness toward enemies, but suffered from over-abundance of English Sparrows, which "usurped the available nest sites," especially on the farms. The chief known causes of nesting losses were unfavorable weather, Blue Jays, fox squirrels, and cats. The percentage of eggs (we are not given the actual numbers) to produce successful young (young that reached the age of 14 days) was 54, 44, and 38, respectively, for the 3 years, averaging 45 per cent, a figure which corresponds to the success of passerines in open nests. The average number of young raised per nest was 1.82; the average percentage of nestings that succeeded was 48. The bulletin includes information on the growth of the young, on food, parasites, and migration, as well as suggestions for management—planting of trees, provision of water, control of *Passer domesticus*.

The bulletin has proved difficult to read, partly because of its condensed form and the author's failure to explain various techniques and tables, and partly because nowhere is there a tabulation of the number of all the nestings, eggs laid, hatchings, and young fledged each year for town and country, with percentages of success and failure. Tables 35 and 36 are impossible to understand without recourse to the author's paper in *The Auk* (59, 1942:64-75), in which actual figures for nestings are given for 1938 and 1939, but this essential article is not, strangely enough, cited in the bibliography of the bulletin.

It is unfortunate that the author did not thoroughly acquaint himself with the published material on the life history of his subject before starting on his project. It is certainly hard to believe that some eggs hatched in 11 days and others in 20 (p. 382); the known co-ordination between hatching of squabs and the appearance of pigeon milk in the parental crops would certainly preclude such a spread. He makes the surprising statement that "usually 24 hours elapsed between eggs, but sometimes they were laid 12 hours apart" (p. 381, italics mine). In my article on the nesting of this species in Oklahoma, published in 1922 and 1923 (*Auk*, 39:457-474; 40:37-58), I cite Charles O. Whitman (Behavior of Pigeons, III. *Carnegie Inst. Wash. Publ.* No. 257, 1919), who stated that with the Mourning Dove the first egg is laid in the late afternoon of one day and the second on the morning of the second day after. This was the case with my captive bird that laid 15 eggs (*Condor*, 33, 1931:148-150). McClure's statements as to the intervals of egg laying could not have been based on wild birds since he did not visit nests twice a day. If his captive Doves laid at such amazingly short intervals, he should have marshalled his evidence and published this contradictory experience as such, not as normal behavior.

As to instances of three eggs in a nest, McClure gives the wrong interpretation (p. 391); the extra egg comes from another bird, or the nest owner lays an egg from her next clutch—six days after the second egg of the first set.

A calculation (p. 409) of the speed of migration is based on the assumption

that a bird started when 19 days old. Although the author's captive birds weaned their young at 16 days, it does not follow that wild young are cast adrift so early. I have seen well grown young, apparently about a month old, still fed by their parents, and McClure himself reports (p. 389) that the "growth of flight and tail feathers continued until the young were over a month old." It does not seem probable that young start migration before the age of 4 weeks.

When the author deals with the success of nests, he is on sure ground. But as soon as he talks about the *number of pairs* involved, at once an unknown enters. It is very difficult to estimate the number of pairs in a crowded population of this species; yet the accuracy of such estimates is of fundamental importance in the matter of the number of broods attempted and calculations of "production," both in the study area and in the county. In the bulletin, the technique used for estimating is not described. In the 1942 paper we read (p. 65): "The greatest number of nests existing in one day during the summer was taken as indicating approximately the number of nesting pairs for the area." On page 74 we are told: "Censusing by this method . . . at best can only be a somewhat closer estimate than a guess." And the reader must take care not to accept the "estimates" or "guesses," presented in the tables and summaries in the bulletin, as proved facts.

McClure considers that the Mourning Dove population in Iowa trebles each year (p. 361). His technique for estimating populations (by counting active nests and using ratios derived in the 1942 paper mentioned above) is illustrated on pages 410-412 of the bulletin. He gets astonishingly high figures: if 20 active nests are found on 20 acres in June "after 5 days of mild weather," $6.6 \times 20 = 132$, the total nesting attempts (6.6, from Table 35, being the observed ratio of daily active nests in June to the season's yield); $50\% \times 132 = 66$, the successful nestings expected; $66 \times 1.82 = 120.12$, the total young production (1.82 being the average number of young raised per nest); $1.1 \times 20 = 22$ breeding pairs (1.1, from Table 36, being the supposed ratio of active pairs seen nesting in June to the total breeding stock); allowing a 10% variation, and correcting for loss (3 to 10 per cent), "the total number of birds expected by the end of the season is 133-175 from 20 acres." In other words, the original 44 birds have *trebled* at the least, *quadrupled* at the most.

In Table 22 of the bulletin, however, estimates of the population on the 220 acres gave seasonal averages of 5.4, 5.1, and 4.6 nesting attempts; these calculations credit them with 6 (132 attempts for 22 pairs). Further analysis of Table 22 shows the average number of breeding pairs to be not 290 (as given in the 1942 paper), but 340, which divided by 260 (the average number of active nests per day in the observation area), gives 1.3 instead of the 1.1 used in his illustration. This revised factor gives 26 pairs to 20 nests, so that the "total number of birds expected by the end of the season" would be only 2.7 to 3.5 times the original population, while the nesting attempts would average 5. That the area (220 acres) on which Table 22 was based is the same as the area covered in the 1942 paper, was confirmed for me by the author. As shown in Table 22, he revised his opinions as to the number of pairs involved, but republished the tables of ratios (Tables 7 and 8, 1942, become Tables 35 and 36, 1943) without revision, and moreover he uses the unrevised ratios to illustrate his method. But even with the above corrections, I still believe the author's figures for the number of nesting attempts and for population increase are too high; I believe he underestimated the number of pairs in town, as well as underestimating the percentage loss of juveniles and adults.

The overestimate of population increase not only weakens the paper and shakes the reader's confidence in the rest of the results—it plays directly into the hands of the hunters, and this in the case of a bird gravely endangered over a large part of its range. The author has done a great deal of hard and faithful labor in connection with this study, and he has obtained worthwhile data. They would have been far more valuable if he had studied the pertinent literature and acquainted

himself with the biology of the species chosen, and also if he had used more care in his calculations.—Margaret M. Nice.

THE BIOTIC PROVINCES OF NORTH AMERICA. By Lee R. Dice, University of Michigan Press, Ann Arbor, Michigan, 1943: $6\frac{3}{4} \times 10$ in., viii + 78 pp., 1 map. \$1.75.

Science is a process of discovering and sorting facts and drawing generalizations from them. New ways of classifying data are always welcome since they may bring to light new scientific principles. Students have proposed various systems for sorting information on the distribution of plant and animal organisms in North America, but only two receive major attention at the present time: the life-zone and the biome systems. In this new book, Dice outlines another scheme of classification, his major units being "biotic provinces," which are subdivided into "biotic districts," "life-belts," and "ecologic associations." A folding map shows the boundaries of the biotic provinces of North America. The book discusses each biotic province in respect to its name, synonyms, boundaries, topography, climate, soil, vegetation, general characteristics of its mammals and birds, and its subdivisions, (though the subdivisions are not worked out completely). Whether or not this system is worthwhile would seem to depend on its being more applicable to the facts than the life-zone and the biome concepts or on its being based on a philosophy so different that new principles are brought to light.

Life-zones are based on the distribution of taxonomic units, chiefly genera and species of animals; biomes on climax plant and animal communities; a biotic province is a "considerable and continuous geographic area . . . characterized by the occurrence of one or more important ecologic associations that differ, at least in proportional area covered, from the associations of adjacent provinces. In general . . . characterized also by peculiarities of vegetation type, ecological climax, flora, fauna, climate, physiography, and soil" (p. 3). Actually, however, Dice here bases his classification of biotic provinces "to a very large extent on the vegetation" and there are no long lists given of indicator species of animals, since "available descriptions of the associations of North America are wholly inadequate." In fact, "the limits of geographic range of species and races of plants and animals are not fully satisfactory criteria for determining the boundaries of biotic provinces and districts" (pp. 5-6).

In order that the provinces may fulfill Dice's primary requirement of being "continuous geographic areas" without the interspersed or overlapping of communities usually found in distribution maps of large biota, they are made to include groupings of plants and animals of great diversity. For example, instead of the Carolinian province extending westward into the prairie as tongues of deciduous forest along the rivers, the Illinoian province is made to include both types of vegetation, prairie and oak-hickory forest. Then again, in the mountains a single province may include a whole series of life-belts, for example, the Navahonian province, which includes alpine meadow, subalpine forest, montane forest, chaparral, pinyon-juniper woodland, and arid grassland. On the other hand, some associations usually considered as single units by other ecologists, for example, the mixed prairie, are here divided into as many as four biotic provinces. Although both are professedly based largely on the character of the vegetation, the boundaries of the biotic provinces and those of the biomes or their subdivisions, rarely coincide.

Biotic provinces as a classification are an improvement over life-zones in that the trans-continental belts of the latter are broken up south of the coniferous forests of Canada. Although the Canadian, Carolinian, and Austroriparian provinces show some correlation with the Alleghanian, Carolinian, and Austroriparian faunal areas in the eastern part of the country, there is no such correlation between provinces and the major faunal areas in the west. In mountainous areas, division by life-zones shows the effect of altitude on distribution better than divi-

sion by provinces does, since "life-belts" (more or less comparable with life-zones) are relegated to minor subdivisions of the provinces.

Names assigned to the biotic provinces are taken largely from the literature, mostly but not entirely upon a priority basis. These names go back for their origin to C. Pickering 1830, R. B. Hinds 1843, J. G. Cooper 1859, J. A. Allen 1871, E. D. Cope 1873, E. W. Nelson 1887, while a few are new. For the most part the names are geographical, which is a weakness.

The reviewer believes that while the concept of biotic provinces shows some improvement over life-zones (except when applied to mountainous areas) it is not so flexible nor so usable, nor is it based on such fundamental principles as the biome concept. Furthermore, the criteria used in determining the boundaries of the provinces are often vague, and the nomenclature is cumbersome. Probably no system will come into general and accepted use unless the delimitation of its units and its nomenclature are immediately obvious in the field because based on conspicuous features of the biota.—S. Charles Kendeigh.

THE WILD TURKEY IN VIRGINIA: ITS STATUS, LIFE HISTORY AND MANAGEMENT. By Henry S. Mosby and Charles O. Handley. Virginia Commission of Game and Inland Fisheries, Richmond, Va., 1943: 6 × 9 in., xx + 281 pp., 2 col. pls., 67 figs. \$1.00.

This reviewer begins with a distinct bias in favor of the Wild Turkey, and would, had he been contemporary, almost certainly have been in full agreement with Benjamin Franklin's desire to make the Wild Turkey our national bird. It is a real pleasure, therefore, to welcome the first comprehensive monograph which has dealt with all phases of the bird's history, life history, and management. The book is a competent and workmanlike job, and will undoubtedly benefit the object of its study.

Although it deals primarily with the Wild Turkey in Virginia, the volume will have a very much wider application and usefulness. The Turkey ranges throughout Virginia, which is a remarkable epitome of all of eastern United States, since it includes conditions that approach the sub-tropical at the Virginia Capes, has a wide segment of the piedmont, an excellent sample of the ridge and valley province, and, on the Allegheny Plateau, remnants of spruce forest which are near-Canadian. We are given information about the distribution of the bird under this wide variety of conditions.

It is good news that Virginia, despite the age of its settlements, had in 1938, 2,020 flocks of Wild Turkeys, made up of 22,575 individuals. The larger number of the state's counties still have a Turkey population, the heaviest concentrations being on the east slopes of the Blue Ridge. The relationship between extensive forest areas and Turkey populations is clearly brought out; where there are not large forests the birds have not persisted.

The authors have had unusual success in artificial propagation of Wild Turkeys, and they have evolved a number of techniques which are being widely adopted by commercial game raisers. Their discussion of management is, therefore, particularly valuable. The statement, "It has been demonstrated that the Wild Turkey responds to management to a marked degree," is elaborated with suggestions for food plantings, predator and disease control, emergency feeding, refuges, and such matters. The authors are on sound ecological ground when they discuss the management of forests for the Wild Turkey. The book includes a suggested policy and program for Wild Turkey management in Virginia which will be of great value to game commissions of other states.

It is through such monographs as this that game management demonstrates its validity as a field of scientific endeavor. Sound ornithology is supplemented by economic evaluation of an animal in relation to man. Both pure and applied science benefit from this happy combination.—Maurice Brooks.

THE BIRDS OF BRITAIN. By James Fisher. William Collins Sons and Co., London, 1942: 6¼ × 8¾ in., 48 pp., 16 pls. (12 colored) and 22 figs. 4s. 6d.

James Fisher again shows his unusual ability as an ornithological writer by producing under this well-worn title an original and stimulating little book.

He makes no attempt to provide assistance in the identification of British birds, but wisely confines himself to presenting attractively and compactly an expert's summary of Britain's avifauna, past and present, its peculiar features, the observers (beginning with Matthew Paris in 1251), and finally, an indication of modern trends and probable future developments of bird study in Britain.

The book is illustrated with 38 rather good reproductions (nearly a third of them in color) of bird portraits by some 20 artists, ranging from Daniel King (c. 1652) to A. W. Seaby (1930). The pictures have been ingeniously chosen to both illustrate the text and give a very good insight into the development of bird illustration in Britain.

Any ecologist in this country will read the book with particular interest and will wonder whether our continent too is bound for such drastic and complete alteration of the original landscape as Britain has undergone.

This attractive book will provide Americans who are going to England in such numbers these days with the perspective so invaluable to any bird student when encountering a new avifauna.—J. Van Tyne.

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