

Appropriation for Refuge-Land Investigations

An appropriation of \$75,000 was made available on July 1, 1929, for use in the work of investigating lands proposed for acquisition as refuges. This preliminary work is in charge of crews of trained biologists and land-valuation engineers working under the direction of the Bureau of Biological Survey. Annual appropriations amounting to a total of \$7,875,000 for the 10-year program of land acquisition and refuge establishment are authorized by the act, and a continuing appropriation of \$200,000 annually thereafter for the maintenance of the refuges.

The units selected for migratory-bird refuges must be of such character as will best serve the purposes contemplated. Usually they will be more or less extensive areas of lowland, comprising marsh and woodland contiguous to or embracing water areas, or they may be areas that were formerly well suited as feeding and nesting grounds for migratory birds, but though now useless by reason of drainage developments or evaporation, are subject to restoration to their natural condition. The reports by the crews engaged on surveys will necessarily have a determining influence in the final selection of units for acquisition and maintenance, but an effort will be made to furnish in every general section at least one extensive refuge, so that the benefits of the system will be available to the birds everywhere throughout the country.

The new conservation measure indicates unmistakably that the United States of America recognizes the tremendous importance of its migratory birds as aids in the development of agriculture, for esthetic purposes, and as a food supply and a source of wholesome recreation.

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MIGRATORY Status of Mourning Doves Is Proved by Banding The mourning dove (*Zenaidura macroura*; family Columbidae), known also as turtle dove and Carolina dove, is distributed over the North American Continent from Panama to southern Canada. This is the greatest range of any American member of its family. As its food consists almost exclusively of seeds and grain, the mourning dove is of considerable importance to the farmer, and its value is enhanced by its being an important game bird in many States.

Few birds exert a stronger esthetic and emotional appeal than do mourning doves. The trim beauty of their form, the soft delicate shade of coloring touched by spots of metallic luster, the whistling sound emitted by the rapid beat of wings in the swift arrowlike flight, and the soothing plaintive quality of their cooing love-note have almost a universal appeal to the finer human sentiments.

Mourning doves nest over the entire United States. The two white eggs are laid in a flimsy nest of sticks usually situated in the lower branches of a tree but sometimes on the ground in the eastern portion of their range. The most important section of their winter range is in the southern part of the country.

Found in South the Year Round

In many States, particularly in the South, mourning doves may be found during every month of the year, and it is probable that some of these individuals are not migratory to any considerable extent if at all, but remain in practically the same region throughout the year. Nevertheless, in common with other migratory species, mourning doves are protected by Federal law. On the basis of information then available regarding their interstate and international movements, a judicial decision was rendered in the Federal court at Athens, Ga., in 1921, which pronounced these birds entitled to the protection afforded by the migratory bird treaty act, even though individuals of the species may remain yearlong within the borders of certain States.

With a view to assembling more complete and definite information regarding their migratory movements and habits, more than 4,000 mourning doves have been banded since 1921 by volunteer cooperators of the Bureau of Biological Survey. From these more than 250 return records already have been received. A study of the scientific data thus obtained definitely establishes the wide-ranging character of the migratory activities of these birds and provides additional positive information in support of the judicial decision cited.

Figure 129 shows only a few examples of these flights, as it is impossible to include on so small a map all of the information now available. Some of the lines, how-

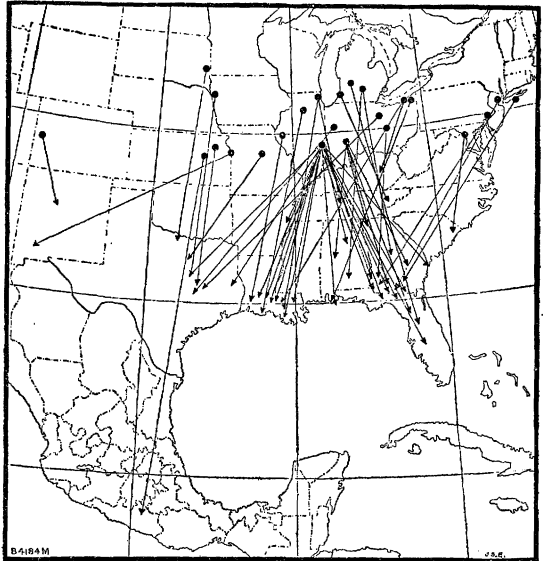


FIGURE 129.—Migratory routes of mourning doves as shown by banding records. Black spots indicate places where the birds were banded; arrows point to localities where the same individuals were recaptured. The straight lines are not intended to represent the actual course taken by the birds in their flights, but to connect points where banded and recovered.

ever, represent return records for three or four different birds the points of banding and recovery of which were approximately identical. Banding mourning doves has revealed many detailed specific facts that are of interest and significance in connection with the annual northward and southward movements of the birds and their status as migrants entitled to protection under the provisions of the migratory bird treaty act and the regulations promulgated thereunder.

As with studies of banding returns of other kinds of birds, it is necessary to consider the movements of mourning doves from two standpoints: (1) Those birds that have returned to the region where they were banded and have been retaken there after the lapse of a full migration season; and (2) those that have been recaptured and reported from points at some distance from the place of banding.

Return to Former Nesting Places Proved

Under the first category abundant evidence has been obtained to prove conclusively that mourning doves may return many times to breed again in the locality where they nested during previous years. At one banding station in central Illinois no less than 66 return records have thus far been reported of individual doves that had been banded at this point in former years. The records of the Bureau of Biological Survey contain similar cases from Pennsylvania, Ohio, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Georgia, Louisiana, Texas, and California.

Considered by themselves these records might be construed to mean that these doves did not migrate at all, but had remained near the point of banding throughout the year. This mistaken interpretation is particularly apt to be made because it is known that mourning doves occasionally will spend the winter as far north as Massachusetts, Indiana, Illinois, and Colorado. Such cases are rare, however, and observations made continuously throughout the year in these regions have shown that there are few, if any, doves present there during normal winters. Furthermore, in the Central and Northern States the return records of birds recovered at the point of banding were obtained during succeeding breeding seasons and not during the winter months, which in itself indicates that the birds are accustomed regularly to go south in the fall and to return the succeeding spring. A few individuals have been retrapped at the same banding station in two successive years. For example, two birds banded in April and May, 1925, at Kansas, Ill., were recaptured at the same point in 1926 and again in 1927, while one banded at Crystal Bay, just north of Minneapolis, Minn., in June, 1925, was recaptured there in June, 1926, and again in July, 1927.

Some of the doves that were banded in the Southern States late in the winter or early in the spring probably made no migration to the North but nested in the same general region. It is significant, however, that in the case of all reports of the return of doves banded in such Southern States as Georgia and Louisiana, there was a period of several months or a year between the dates of banding and recovery, which would allow the birds to make a trip to the North and back again during the interval before being retaken.

Final Proof of Migration

The final evidence to establish completely the migratory status of mourning doves is furnished by many birds that have been banded in Northern States and recovered far away in the South, either during the same or in succeeding years. It is interesting to note from banding records of such birds that the majority of the doves that breed in the Northern States apparently spend their winters in the States of Georgia, Louisiana, and Texas. This is graphically illustrated by the map, which shows points of banding and recapture of doves for which return records have been received.

The State of Georgia seems to contain the favorite wintering grounds for the mourning doves of the eastern part of the country. No less than 15 records have come from that State, representing birds that were banded in Illinois, Michigan, Indiana, Ohio, Pennsylvania, New York, and New Jersey. Louisiana comes next, with 12 records, but

strangely enough these come from only two States: Illinois and Ohio. Texas ranks third, with 9 records of doves banded in South Dakota, Iowa, Kansas, Missouri, Illinois, Indiana, and Ohio. Six doves banded in Illinois, Michigan, Indiana, and Georgia were recovered in Florida, and five others from Illinois, Michigan, Indiana, and Ohio were taken in Alabama. Along with these records of recoveries in the principal winter range of the species, there are many intermediate points represented in the banding records, giving returns for these birds from points scattered through South Carolina, Tennessee, Kentucky, Arkansas, and Missouri.

As in all groups of return records from banded birds, there are a few cases of unusual flight routes, two of which are shown on the map. One is of a young bird that was banded at Kansas City, Kans., in June, 1927, when it was just beginning to fly, and was shot in Luna County, N. Mex., on September 17, 1927. This bird had flown southward instead of following the course due south, as did other birds banded in the same general region. The other record was of a bird banded at Fort Riley, Kans., on July 5, 1926, and shot at Apipilulco, State of Guerrero, Mexico, in January, 1927. This represents the longest migratory flight yet recorded for a mourning dove.

To sum up the meaning of the facts deduced through application of the banding method for determining the migratory movements and status of mourning doves, it has been conclusively shown that these birds are migratory in habit and that their flight is both interstate and international; that they may return to the same point to breed during succeeding years; and that there is a marked tendency for birds reared during summer over a widely distributed area in the northern part of their range to congregate during winter in a relatively restricted region in the South. Establishment of these facts is of importance in considerations of their esthetic worth and economic status and in taking effective steps to afford them adequate protection.

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MORTGAGE Debt on U. S. Long-term loans secured by farm
 Farms Increasing But land and buildings continue to
 at a Decreasing Rate grow in importance as a means of
 financing the American farmer.

According to recent estimates, the total farm-mortgage debt rose from \$7,857,700,000 in 1920 to \$9,360,620,000 on January 1, 1925, and further increased to \$9,468,526,000 by January 1, 1928. These figures represent an increase of 19 per cent from 1920 to 1925 and a further rise of 1 per cent from 1925 to 1928.

For the 3-year period ended January 1, 1928, the largest relative increase in mortgage debt occurred in the South Atlantic States, an increase of 12 per cent above the debt in 1925. The debt in the East South Central group increased 7 per cent, in the West South Central and East North Central 5 per cent, and in the Pacific group 3 per cent.

Four geographic divisions showed declines in amount of farm mortgage debt, the Mountain States having a reduction of 7 per cent below the amount in 1925, the West North Central 2 per cent, the Middle Atlantic States 3 per cent, and the New England group 1 per cent.