THE WINTERING OF A NORTHERN FLICKER IN CENTRAL IOWA

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THE Northern Flicker (*Colaptes auratus luteus*), well known as a summer resident in the northern states, also occurs there in winter more or less regularly. The A.O.U. Checklist (1931) gives the breeding range of this bird as follows: " . . . from Canada east of the Rocky Mountains and north to the limit of trees in Alaska and throughout the northern and central United States south to the northern edge of the lower Austral Zone," and continues by stating that the bird is, " . . . more or less regularly resident except in the extreme northern parts of its range." For Iowa, DuMont (1934), summarizing the observations of several coöperators with his own, speaks of the flicker as uncommon in winter.

At Ames, Iowa, Errington (1936) found several flickers that attempted to winter over in 1935–'36, unsuccessfully, and he was intrigued to try to account for their behavior in feeding habits. The Flickers that he observed quite habitually utilized the source of food that was nearest at hand. Errington's observations seemed to indicate that the birds filled up on the material nearest at hand, often to the exclusion of corn in a field which was farther away, but probably more nutritious. Some of the Flickers died with their crops quite well-filled with sumac (*Rhus glabra*) seeds, and the fecal analysis showed a perdominance of sumac over all other foods utilized; only about 1.8 per cent of the droppings indicated insect food.

The findings of Errington stimulated the writers to be on the watch for wintering Flickers close at hand in late 1936. Not one was seen apparently settled in a territory until late in January, 1937, when the senior author came across a male Flicker that spent most of its time during the winter in and around a 40-acre tract of timber, a permanent preserve of virgin forest and a part of the Campus of Iowa State College. He spent the night, at least, during the more severe weather in the hollow of a dead hickory tree (*Carya glabra*), standing near the center of the northwest quarter of the forest. The preserve, rolling in topography and supporting several ecological plant formations, furnished a variety of winter plant food. Furthermore, dead trees left in the area held an increased insect population that might be used as food by birds. Supplementing these natural food-supplies were a considerable number of apples hanging in an old orchard about 100 yards north of the wooded area, and the fruits of a small planting of cultivated trees bordering the north side of the timber. East of the timbered area lay an un-

harvested cornfield from which the squirrels carried numerous ears of corn into the woods during the winter.

At Ames the first severe weather of the winter of 1936–'37 came in the first 10 days of December when the temperature fell as low as −7°F. and was accompanied by some snow. The remainder of the month averaged near freezing temperature with about one inch of precipitation mostly in the form of rain during the last seven days of the month. January temperatures, with a low of −11° F., and a high of 36° F., averaged 5° F. below the 65 year average. During the month 1.97 inches of precipitation in the form of sleet fell during the first few days, and snow later. Early February was quite severe with a low of −16° F. on the 10th, whereas the last 10 days were mild. Precipitation and the average temperature were about normal for the month. The temperature during the period, December 1, 1936 to March 1, 1937, averaged 20.4° F., which was 1.1° F. below the 65 year average of those months for the State. This was somewhat warmer than the record breaking low of the preceding winter with the coldest February in 117 years. These weather data were obtained from the United States Weather Bureau (1936, 1937).

At the first observation, in late January, a considerable quantity of fecal material was seen in the bottom of the hollow in the tree, but none of it was collected until February 15th, when all of the droppings were removed. During the relatively mild weather of late February the Flicker did not always use the tree at night; consequently only a small amount of feces were found after the first collection. One collection consisting of a half-dozen droppings was made on February 24th, and another of only two droppings on March 1st. The bird was not known to have used the night tree after March 1st, but, as the severe weather was already past, it may be safely stated that this Flicker wintered successfully.

Analysis of the feces showed that this Flicker took quite a wide variety of foods. Somewhat over half of the total of 77.8 cc. of feces examined was so thoroughly digested that it could not be identified. Of the remainder, 23 per cent consisted of animal material and 77 per cent of plant material. The animal material contained ants' remains made up of exoskeletons of 90 carpenter ants (*Camponotus herculeanus pennsylvanicus*) with two individuals of another species, and skeletal remains of two lepidopterous larvae, four small Coleoptera (unidentified), one darkling beetle (*Tenebrio* sp.), three squash bugs (*Anasa tristis*), and one Arachnid. The plant material was made up of greenbrier (*Smilax rotundifolia*), 181 seeds, in quantity 4.8 cc., or 16.7 per cent of all recognizable materials, and pulp associated with the seeds, 8.2 cc. or 28.5 per cent; poison ivy (*Rhus toxicodendron*), 150 seeds, 3.6 cc., or 12.6 per cent; apple pulp 3 cc. or 10.1 per cent; Virginia creeper (*Psedera* sp.)

seeds and seed shells, 2.0 cc., or 6.9 per cent; grape (*Vitis* sp.) seeds and seed shells, 0.6 cc. or 2.2 per cent; and corn a small amount represented by a few hulls.

The above figures do not necessarily indicate how much of each item the bird ate, because the proportion of the amount ingested to the amount passed in the feces would vary from one food to the next. For example the figure for insect material is probably low in comparison with the amount actually taken because insects would probably be more thoroughly digested by a Flicker than would most plant material.

A comparison of relative abundances and proximities of the various foods actually eaten by the Flicker with those possible sources of food not utilized show that the bird did not always consume in largest amounts the food that appeared to us to be closest at hand, nor that was most abundant. Although no attempts were made to determine the abundance of the insect forms in the preserve, in an area of this kind with numerous dead trees and decaying logs it might reasonably be expected that such forms as those found in the feces would be quite abundant, for they are insects that hibernate just under the bark, in rubbish and in punky logs. The insect remains in the feces were invariably found in a mass not mixed with the vegetable material, and consisted of all parts of the insects' exoskeleton and not just the spiny parts. As McAtee (1935) pointed out that it is physically impossible for insect remains to become lodged for any length of time in a bird's stomach, it was assumed the insects were taken during the period when the flicker roosted in this tree. Perhaps the bird obtained the bulk of its insect food during the third week in December, for then ants were observed by the senior author to be active, though somewhat sluggish. The insects hibernating in rubbish or in logs on the ground would probably not be available after the early January snow and sleet storms until the February thaws about the middle of the month. Any insects that hibernated under the bark or in upright trees would be more or less accessible at any time during the winter.

Of all the plant foods that Flickers have been known to eat, the one in this area that was nearest to the night tree and still of reasonable abundance was a thicket of sumac (*Rhus glabra*) covering about 1.5 by 3 rods in area at a distance of 100 yards. The sumac bore numerous fruits estimated at 130 clusters which were still on the bushes during the spring months. It will be noted from the analysis data that sumac was lacking. The plant foods of which this bird made the most use were greenbrier and poison ivy. There were six sizable clumps of greenbrier at distances of 160 or more yards from the night roost, and a patch of poison ivy 0.5 by 6 rods, with approximately 300 clusters of fruit, at a distance of 200 yards from the same point. Neither of these was as close to the night

roost as the sumac that was not utilized at all. Furthermore, to get to the poison ivy required a flight of at least a few yards in the open and feeding in relatively unprotected territory. This was not the case with the planting of cultivated trees bordering on the north of the native timber area. These trees, at a flight distance from the night tree about equal with that to the poison ivy, were directly adjacent to the woods and formed relatively good cover. This planting was made up of 14 buckthorns (*Rhamnus* sp.) bearing very numerous fruits, and 16 junipers (*Juniperus* sp.) which bore a few fruits throughout the winter. Apparently neither of these possible food sources was utilized.

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RESULTS OF 1936 BIRD BANDING OPERATIONS AT AVERY ISLAND, LOUISIANA, WITH SPECIAL REFERENCES TO SEX RATIOS AND HYBRIDS

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WHEN a large number of birds of any species are banded at one station, and such banding continued for many years, interesting features in the life history of the birds are discovered which could not be determined in any other manner, one of the most interesting of which is the sex-ratio.

During the more than twenty-five years I have been banding migratory wild-fowl and non-game birds at Avery Island, Louisiana, my records show that the yearly proportion of males to females taken in my traps has remained about the same, and there has been little variation from year to year of this proportion.

Reviewing my banding records for the year 1936, during which year I banded 17,991 migratory birds, 9,908 of which were wild-