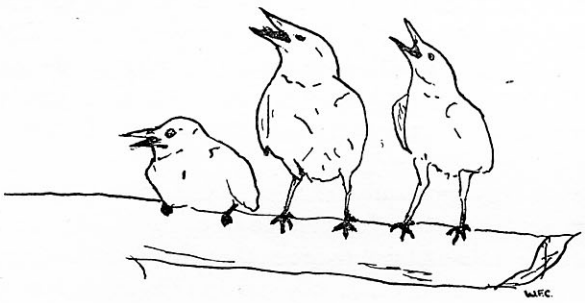
SOME STUDIES ON THE EASTERN CROW

By Edward J. Reimann

In the "Oölogist" of June 1934, in his 'Random Notes on the Crow in Philadelphia, Pennsylvania,' Richard F. Miller states the fact that, "just as many Crows nest in Pennypack Park, Philadelphia today as nested there 30 years ago." "At least 30 pairs of Crows annually nest in this park; just as many today as in 1897 when I first started to study birds." Pennypack Park is a city owned area comprising a thousand acres. It is located in the northeastern section of the city, and extends six miles along the banks of the Pennypack Creek. The whole course is fairly well wooded with deciduous trees. In his article, Miller voices the question, "What becomes of the young Crows annually raised by these thirty nesting pairs?"



Such a problem need not remain unsolved. In the spring of 1939, the writer, assisted by Mr. Miller, started a Crow survey of this region. It was proposed to choose a given area involving most of the park, locate all the Crow nests in the area, and tag the legs of the youngsters with bright red bands. This same method would be carried out in succeeding years, using different colors each year.

To add to Miller's question I may also inquire—Does exactly the same pair use the same nesting locality each year?—Will the young claim the nesting locality where they were brooded for their own nesting site?—What percentage of young will be successfully reared?—If the young take the course prompted by the theory that they build up the extent of range of the species, just how far do they travel?—If the same pair of adults do use a definite locality year after year, will adults or young replace them if they are destroyed? Where would such replacements come from?

To begin this Crow project, the nests first had to be located. The birds occupy a definite nesting locality each year where they build a new nest. Those of the previous years can be found in the immediate vicinity, and these old nests proved an asset in locating the new ones. The next procedure then was to climb to these nests. The average nest was placed about 40 ft. above the ground. Of the 31 nests located, the highest was 100 ft. and the lowest 30 ft. The highest nest Miller has ever recorded was 100 ft. up in a tulip tree, and the lowest was 9 ft. up in a viburnum bush. When Crows are not molested, they tend to nest in low locations; but when persecuted, they nest high. Almost any type of tree

will be used, but there are favorites. Years ago, before the blight, the chestnut was the favorite nesting tree of the Crow in the Philadelphia region. Today, their predilection is the pin oak; while many are placed in red maples, beeches, white oaks, tulips, white ashes, red oaks, black oaks and willows.

Miller states that the Crow builds as substantial a nest as any of our birds, consisting of seventy per cent of bark strips of various kinds, and sticks are used only as a foundation. Some nests contain hardly any sticks, whereas others appear, from the ground, to be made entirely from this material. Earth is used in almost every nest examined. Moss is also occasionally used. The nest is warmly lined with fine weed or bark strips, cattle hair, or other soft materials; feathers are rarely used—I examined a few with feathers which belonged to the Crows themselves. Miller finds that the average nest measures 12 inches across by 7 inches in thickness; the compact and deep cup measuring 4 inches in depth by 7 inches in diameter.

On the average, a Crow nest may look quite similar to that of a Cooper's Hawk when viewed from the ground, but there happens to be a slight difference. Of the foundation, the Crow arranges the outside twigs so that their butt ends or the widest diameter of each twig points outward, whereas the Cooper's Hawk reverses this process and exposes the point end or smallest diameter to be viewed.

In building, Crows do not pick dead sticks from the ground but break them off a standing tree. New nests can be determined by the presence of a bunch of fresh twigs that have accidently fallen to the ground directly underneath the nest. It seems that the birds never retrieve these once they have fallen but proceed to gather new material. When built in a beech tree, the nest is composed of beech sticks. When in another, the twigs appear to be of the same color as that of the host tree.

A bird on the nest incubating eggs voices a peculiar and definite call which appears to be a request to its mate for food. This utterance is a low pitched 'caw' but with a decidedly cracking hoarseness. Although there were a few exceptions when the birds would slink off the nest before our approach, most of the birds seemed to sit very tight and would not readily flush from the nest even after the tree was tapped once or twice. They reluctantly flew off when an incessant rapping was set up or when I started to climb the tree. Some Crows are easily seen on their nests with their tails protruding over the edges, while others crouch down so compactly that they are indiscernable from the ground.

Miller, up to the year 1937, had personally examined 1,076 nests of the Crow. Of this number 222 were empty, due probably to an early visit to the nest before the eggs were laid. Of the total number 145 contained young. Of the remaining 709 nests, 35 contained 1 egg; 35 contained 2 eggs; 81 contained 3 eggs (all of these were probably incomplete sets); 162 nests contained 4 eggs; 301 contained 5 eggs; 87 contained 6; 5 contained 7; 1 contained 8; and 2 contained 9. It can readily be seen that the average number of eggs to a clutch is 5.

The period of incubation is approximately 21 days. The eyes of the newly hatched young are closed. The young appear entirely naked but possess about

4 or 5 filoplume feathers on the underside of the body. It is evident, that when 3 or 4 eggs are laid, the adult commences to incubate, not waiting for the full complement of the set. I found that, in large sets, the young are one to three days farther advanced than the pipped eggs.

A peculiar behavior of the young was displayed when I was up at the nests. The brood would be resting serenely in the cradle without ever uttering a sound. Then at the sound of my voice, all the heads would pop up simultaneously and their beaks would open wide as they whimperingly implored me for food. The reaction to my voice was instantaneous. Their beaks would remain upraised for a few seconds, and then, as they dropped, all would be quiet. Then, with another sound, the resurrection would begin anew. While I was working at banding the young up at the nest, I could see the adults above circling and flying about nervously. Usually, they are joined by many more who show much concern as they voice a great deal of cawing. These birds are probably other nesting pairs in the vicinity.

Young Crows 28 days old are not black but show a decided dark gray color. The legs and feet, however, are black with a yellow horn color on the soles of the feet. The eyes are steel gray and the beak is dark gray. When handled, young Crows shed much of the flaky cuticle deposit of the growing feathers. The young are just about ready to fly in about 30 days after hatching. 5 young, 26 days old, fluttered to the ground when I approached the rim of their nest. For the first few days, they stay near the nest where they will be seen climbing around the nesting tree and occasionally flying to neighboring trees.

Getting back to the questions previously mentioned. Does exactly the same pair use the same nesting locality each year? It has been previously mentioned that a definite locality is used year after year which is evidenced by the presence of the old nests. Sometimes four or five old nests will be found within an acre of territory; but whether the same pair uses this locality repeatedly, is a problem yet to be expounded.

Will the young claim the nesting locality where they were brooded for their own nesting site? This is a question which can only be solved at a later date by checking the nesting pairs for colored bands. It is generally assumed that the young find new nesting sites to breed. This usual procedure results in building up the range extent of a species.

What percentage of young will be successfully reared? It has been pointed out that the usual number to a set of Crow eggs is 5. Locating the nests on this survey before the actual banding of the young, I had examined 23 nests which yielded a grand total of 93 eggs and young mixed. From this evidence, it can be seen that the average set of eggs on the survey totaled 4.04 per nest. The young banded at a later date from these same 23 nests totaled 70 birds which would indicate that the average number of the brood that survived till that time was 3.04 birds per nest. One of the chief reasons governing nest mortality among Crows is, I believe, the crowding action of the growing birds which eventually leads to the destruction of one or two as they are pushed from the rim of the nest.

Nests containing 2 or 3 young newly fledged were less apt to have their original status changed when the young would be fully fledged, whereas in large clutches of 5 or 6, a definite mortality would be evidenced.

One of the nests was destroyed by some undetermined animal. Off the survey area, I had examined a nest in which there were supposed to be young Crows just ready to band. Climbing the tree, I found the top of the nest neatly arched over with dead leaves, and nestled within the cup, originally provided by the Crows were 2 naked young Gray Squirrels.

If the young take the course prompted by the theory that they build up the extent of range of the species, just how far do they travel? This can be answered only by the reappearance of banded birds.

If the same pair of adults do use a definite locality year after year, will adults or young replace them if they are destroyed? This question can only be answered after the survey has extended through a period of years.

The entire area probed, a creek valley, totaled 2.35 square miles. Within this sector we had located 31 Crow nests. Therefore the average number of nests per square mile in this particular terrain was 13.1901 or roughly 13 and $\frac{1}{5}$.

The evident facts discovered during banding operations are the results of just one season's operations. This study of the Crow will continue from year to year. Young Crows will be banded in as many nests as can be located and the special territorial project involving the use of colored bands will continue along the Pennypack Creek.

With this in mind, the writer extends to all D.V.O.C. members, those of other local ornithological clubs, and all others that are interested, an invitation to join him in this study. This can be done by submitting facts concerning the life-history or psychological behavior of the Crow as yet unknown, by forwarding information as to the exact locations of occupied nests found, by observing Crows with colored bands attached to their tarsi and advising of the date, locality, and present activity of the bird, and finally by banding and assisting in the banding of Crows.

As a result of continued probing, and with local cooperation, the future will uncover additional facts about the Crow, and it is the intention of the writer to publish these reports as the study progresses.

CROW NESTS IN PENNYPACK PARK—THE SPECIAL TERRITORIAL STUDY AREA

Nest Number	Locality	Date Found	Contents When Found	Tree	Height of Nest
1.	Willet's Run	April 10	3 Fresh Eggs	Tulip	60 Ft.
2.	Lower Rhawn St.	April 10	2 Fresh Eggs	White Oak	60 Ft.
3.	Hartel's Dam	April 10	5 Fresh Eggs	Willow	35 Ft.
4.	Swamp Misery Ridge	April 10	2 Fresh Eggs	White Oak	65 Ft.
5.	Martin's Woods	April 10	Not Examined	Red Oak	65 Ft.
6.	Walnut Hill Woods	April 10	5 Fresh Eggs	Black Oak	60 Ft.
7.	Castor's Meadow Woods	April 19	5 Eggs	Tulip	45 Ft.
8.	Upper Rhawn St.	April 19	Not Examined	Sassafras	65 Ft.
9.	Holme Ave.	April 15	5 Eggs	Pin Oak	40 Ft.
10.	Boulevard	April 20	5 Young (2 days old)	Beech	75 Ft.
11.	Boulevard	April 20	4 Eggs	Black Oak	60 Ft.
12.	Biddle's Meadow	April 20	3 Young and 3 Pipped Eggs	White Ash	25 Ft.
13.	Krewstown Meadow Woods	April 20	5 Eggs	White Ash	45 Ft.
14.	Krewstown Meadow Woods	April 20	3 Fresh Eggs	White Oak	60 Ft.
15.	Krewstown Meadow Woods	April 20	Not Examined	White Oak	60 Ft.
16.	High Bridge Woods	April 20	6 Eggs	Tulip	55 Ft.
17.	High Bridge Woods	April 20	4 Eggs	Beech	45 Ft.
18.	Woodhid Woods	April 20	5 Eggs	Tulip	80 Ft.
19.	Daylily Woods	April 20	Not Examined	Walnut	50 Ft.
20.	Bustleton Country Club Woods	April 21	Not Examined	Tulip	70 Ft.
21.	Ryerss's Woods	April 21	1 Fresh Egg	Tulip	70 Ft.
22.	Paul's Run	April 21	5 Eggs	Wild Cherry	30 Ft.
23.	Paul's Run	April 21	5 Young (2 days old)	Beech	65 Ft.
24.	Pine Road Woods	April 21	Not Examined	Tulip	100 Ft.
25.	Pine Road Woods	April 21	4 Young and 2 Pipped Eggs	Beech	40 Ft.
26.	Vereeville	April 21	Not Examined	Black Oak	70 Ft.
27.	Boat House	May 8	2 Young (18 days old)	White Ash	50 Ft.
28.	Sandy Run	May 8	Not Examined	Red Oak	80 Ft.
29.	Boulevard	May 8	3 Young	Beech	40 Ft.
30.	Boulevard	May 8	3 Young	Red Oak	50 Ft.
31.	Pine Road	May 17	3 Young (2 weeks old)	White Oak	60 Ft.

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Nest Number	Nest Habitat	Number of Young Banded	Date Banded	Age When Banded
1.	High Tulip Woods	2	May 9	10 Days
2.	High Woods of White Oaks and Beeches	5	May 9	8 Days
3.	Low Swampy Thicket			
4.	High Ridge of Tall Oaks and Tulips	1	May 9	10 Days
5.	Narrow Ridge of High Trees			
6.	High Woods—Nest in Corner Along A Run	2	May 9	2 Weeks
7.	Young Tulip Thicket—Once A Cultivated Field	5	May 8	2 Weeks
8.	High Tulip Strip on Hillside	5	May 8	2 Weeks
9.	Low Thicket of Pin Oaks	4	May 7	2 Weeks
10.	High, Deep Woods of Oaks, Tulips and Beeches	4	May 8	3 Weeks
11.	High, Deep Woods of Oaks, Tulips and Beeches	2	May 8	3 Days
12.	Along Creek on Edge of A Cultivated Field	5	May 7	18 Days
13.	Young Thicket—Once A Cultivated Field	3	May 16	3 Weeks
14.	Low Edge of Hillside Strand of Tall Trees	2	May 16	2 Weeks
15.	Low Edge of Hillside Strand of Tall Trees			
16.	Young Tulip Thicket	5	May 16	3 Weeks
17.	High Trees on Top of Valley Ridge	3	May 16	3 Weeks
18.	Deep, Dense, High Tulip Woods			
19.	Open Glade, Low Ground Along Creek			
20.	Deep, Dense, High Tulip Woods			
21.	Open Woods of High Tulips	2	May 17	6 Days
22.	Low Thicket Along Ravine	4	May 17	3 Weeks
23.	High Trees Along Ridge of Ravine	5	May 17	26 Days
24.	Highest Tulip Woods in Park			
25.	Open Woods of High Trees			
26.	Crest of Ridge of Steep Bluff	3	May 16	10 Days
27.	Open Lowland Thicket	2	May 8	3 Weeks
28.	High Trees Along Ridge			
29.	High, Deep Woods of Oaks, Tulips and Beeches	3	May 8	10 Days
30.	High, Deep Woods of Oaks, Tulips and Beeches	3	May 8	5 Days
31.	High Deep Woods	3	May 17	2 Weeks