

A PRELIMINARY REPORT ON THE BREEDING BEHAVIOR OF THE BLUE JAY IN ANOKA COUNTY, MINNESOTA

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Although the Blue Jay (*Cyanocitta cristata*) occurs commonly across most of eastern and central North America, much of its breeding behavior and other habits remain unknown to ornithologists. In an attempt to fill in some of the gaps in our knowledge of the Blue Jay, we began a study of the behavioral ecology of the species in the spring of 1980. This article summarizes briefly some of our findings in the first field season.

Previous researchers who have dealt with the Blue Jay have often given up on field studies because the species presents several problems. Blue Jays are sexually monomorphic, wary of traps and nets, difficult to age, and especially secretive during nest-building and incubation. This latter behavior seems to have created the most difficulties for researchers, such that sufficient numbers of nests could not be located.

No such problem occurred in the Cedar Creek Natural History Area of the University of Minnesota in northern Anoka County, Minnesota, where we were able to find 121 nests within a 275 hectare area (about one square mile) which included a housing subdivision adjoining the Cedar Creek preserve itself. Of these nests (all located between 14 April and 15 July 1980), 88 were either never completed or deserted and/or preyed upon, with only 33 broods surviving to banding age (8-14 days), and four of the latter were preyed upon after banding but before fledging. Local predators probably included the Common Crow, chip-

munks, red and gray squirrels, bull snakes, raccoons, weasels, and feral cats. The only "predation" which was actually observed occurred when a young boy took his pet cat up a tree and allowed it to knock a clutch of eggs from the nest.

Most of the nests in the Cedar Creek study area were located in northern pin oaks (*Quercus ellipsoidalis*) or bur oaks (*Q. macrocarpa*), typically about five meters up and along the main trunk, or a few feet out on a major horizontal branch. Nests begun in April and May, before most of the leaves were out on the oaks, were placed lower in the trees than later nests, some of which were as high as 15 meters. A few nests were also found in the interior branches of eastern red cedar (*Juniperus virginiana*) and white spruce (*Picea glauca*). Nests elsewhere, such as at an alternate study site at Carlos Avery Wildlife Management Area just south of Cedar Creek, occasionally were located in other hardwoods such as Red Maple (*Acer rubrum*) and European Buckthorn (*Rhamnus cathartica*).

Once we had found the first nests, finding others became easier as we got the "feel" for where to look. Some nests were found by accident, but the most successful method consisted of letting an adult jay lead us to the right location following its foraging trips. During incubation, the male Blue Jay occasionally feeds the female at the nest, and both parents become more and more active as the hatched young mature; these habits sometimes led the



MAN-MADE NESTING MATERIALS — Blue Jays often include light-colored natural materials such as birch bark and dried weeds in the outer stick portions of their nests. Many nests in suburban areas also contain a variety of man-made materials. This photograph illustrates an "extreme" case of the latter in that the nest contained several tissue paper and cloth strips, three long white polyethylene ribbons, and two of the plastic "thingamajigs" used to hold six-packs of canned drinks. None of these human discards interfered with incubation by the female (shown here on the nest) or with the feeding of the young. Although this aboreal trashpile quickly attracted the attention of the photographer, it apparently did not serve as a signal to predators, and three color-banded young fledged on about 9 June 1980. (Photo by Bill Hilton Jr.)

observer directly to the nest itself. Probable nesting areas were also determined by listening for the "kueu-kueu-kueu" vocalization, a conversational call used by mated pairs. This sound was almost inaudible in even the slightest wind, especially by comparison to the loud, raucous "jay-jay" and the clarion "wheedle-ee" which are usually associated with Blue Jay vocalization. This call was worth listening for because it was often given in the vicinity of an active nest.

Still other nests were easily spotted because of the jay's habit of placing white material along with the dark sticks that make up the bulky outer layer. Many jay pairs incorporated birch bark into the exterior construction, while others stuck in bits of tissue paper, white rags, string, and other man-made materials. Several of the nests even contained one or more of the plastic "thingamajigs" which are used to hold six-packs of canned drinks; one nest actually contained four of these items stuck in among the more natural twigs. Another unusual nest was placed in the top center surface of the abandoned bulky leaf nest of a gray squirrel; several squirrels were also known to have built their leaf nests on top of deserted Blue Jay stick nests.

All the jay nests were lined with soft rootlets woven into a cup which contained from 2-6 eggs. April and May nests contained four or five eggs per clutch, while most later nests held two or three. In the majority of nests, at least one egg did not hatch. Although many of the adult jays in the study area were trapped and color marked with plastic leg bands, we were able to identify both parents for only five of the nests. Thus we could not determine in the first field season whether the later nests were re-nesting attempts following predation or desertion. It seems unlikely, however, that the later nests were second clutches following successfully-fledged first broods. Double brooding is common among Blue Jays in the southern U.S.,

but it has never been documented in Minnesota, probably because of the relatively short breeding season, and especially since parent jays are kept busy responding to begging attempts by the offspring for up to two months after they leave the nest.

The average incubation period for the Cedar Creek nests was 17-18 days, somewhat longer than the 15-17 days cited by Roberts (1932). Incubation apparently does not begin until the clutch is complete, since synchronous hatching was the rule. Young remained in the nest for 17-20 days after hatching; by banding and color marking the nestlings at about 9-10 days we probably avoided causing premature fledging.

Early dates for nest-building, egg-laying, hatching, and fledging for the Cedar Creek birds coincided with those of the earliest nests mentioned by Roberts (1932), with the first nests being completed on 23 April and the first eggs being laid one day later. [One 1980 nest in Roseville was somewhat ahead of these early dates, with a clutch of five eggs already complete by 20 April, and hatching occurring on 9 May.] The last nests at Cedar Creek had hatch dates slightly later (8 July) than the latest of Roberts (5 July).

In all, 113 Cedar Creek nestlings were banded with numbered aluminum U.S. Fish & Wildlife Service bands and an individual combination of colored plastic leg bands. Another 32 fledglings whose nests we did not locate were also captured and banded. These birds, when added to the 219 "adults" trapped at nests or at feeding stations, brought the total to 363 Blue Jays which had been marked as of 1 October 1980. Some of these were migrants that moved on out of the Cedar Creek area, but many may be resident birds that may breed in the vicinity in future years.

Pitelka (1946) and others have suggested that most hatch year birds do indeed migrate during their first fall, so that birds seen in Minnesota in win-

ter are either permanent resident adults or possibly migrant birds from farther north in Canada. Our preliminary results indicated that considerably more hatch year birds overwinter than Pitelka had suspected, but the evidence is still strong that a differential migration based on age does exist. With a differential migration, we might expect four potential breeding classes of jays in spring: 1) permanent resident adults, 2) permanent resident hatch year birds, 3) migrant hatch year birds, and 4) possibly some adult migrants. By the time the migrant birds return to these northern latitudes (about the second week in May), the overwintering adults have already begun nesting, and we will be interested primarily in determining in 1981 whether these new arrivals can compete successfully as later breeders, and whether the relatively few young birds which overwinter are able to breed in simultaneous competition with adults. By trapping intensively during the winter of 1980-81, we hope to be able to color mark the majority of resident birds so that we can identify most of the breeding jays in the spring of 1981, thereby coming closer to answering the question of breeding success based on age class.

Because Blue Jays appear to make use of a fairly large winter feeding range, it is possible that some of the color banded Cedar Creek birds will wander away from the study area. One jay already has been recovered from Stacy, about 16 km east, and birds have been spotted up to 5 km away at feeding stations. Observers of these birds are asked to report the following information: location, date and time of sighting; color band/aluminum band combination (most birds have two bands per leg, including the aluminum; colors used include

red, yellow, light blue, light green, white, black, orange, and lavender); general habitat type; activity of the bird. If the jay has been captured by another bird bander, please measure the wing chord, culmen, tarsus, tail, and weight, and release the bird. Dead birds should be frozen immediately with the bands intact.

Please report sightings to Hilton at the address or phone numbers below, and inform the Bird Banding Laboratory, Laurel MD 20811. We would also appreciate information about active nests in the Minneapolis-St. Paul metropolitan area in 1981-83 so that nestlings can be banded, and would like other information about Blue Jay breeding habits and success during past years. Nests found in future seasons can be reported to Hilton or to the Minnesota Rare Bird Alert number.

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LITERATURE CITED

- Pitelka, F. A. 1946. Age in relation to migration in the Blue Jay. *Auk* 63:82-84.
- Roberts, T. S. 1932. *The Birds of Minnesota*, Vol. 2. Univ. of Minnesota Press, Minneapolis.
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