

BROWN-HEADED COWBIRD **BROOD PARASITISM ON THE EASTERN PHOEBE**

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The ammunition storage area at Seneca Army Depot, Romulus, New York, contains fifty small concrete structures, six feet square and seven feet high, evenly distributed throughout 5,000 acres. These shelters and several small bridges provide undisturbed yet easily checked nesting sites for two common birds that build adherent nests, the Eastern Phoebe (*Sayornis phoebe*) and the Barn Swallow (*Hirundo rustica*).

A study of the nesting biology of these species was initiated on June 9, 1973, and continued throughout the 1973 and 1974 breeding seasons. All bunkers and bridges were checked weekly. This paper is concerned only with brood parasitism by the Brown-headed Cowbird (*Molothrus ater*) on the phoebe during the 1974 breeding season.

The late starting date caused me to miss the first month of phoebe nesting in 1973. I found only two cases of cowbird activity in 41 nests, each a single egg that caused the phoebe to abandon its nest. The early May start in 1974 presented a different picture, with 23 cases of cowbird egg-laying in 71 nests. After June 8, 1974, cowbirds were involved in only three of the nests. Nesting activity was almost over by the end of July. The data gathered suggest that although the Brown-headed Cowbird breeds throughout May and June, with most of its activity in the first two weeks of June (Bent, 1958), parasitism against the Eastern Phoebe is directed almost exclusively against the first nestings in early May, and the phoebe is not bothered much thereafter when the cowbird concentrates on other species (see Appendix 1). Hann (1941) was of the opinion that first nests of all species generally received the most cowbird eggs.

Bent (1940) quotes Friedmann (1929) as noting that the phoebe is "one of the very commonest foster parents of the young cowbird. In regions where both species are common, fully 75 percent of the nests contain eggs of both kinds." Pressure is not nearly that intense at Seneca Army Depot, but it is significant, as shown in Table 1.

Table 1. Effects on Phoebe

	<u>No. of Nests</u>	<u>Number Successful</u>	<u>No. of Eggs</u>	<u>Number of Young Fledged</u>
Parasitized Nests	23	4 (17%)	48	6 (12.5%)
Unparasitized Nests	48	35 (73%)	202	150 (74.3%)
TOTALS	71	39 (55%)	250	156 (62.4%)

The figure for number of eggs in parasitized nests includes only those phoebe eggs actually counted, and not those removed by the cowbird hen. A more realistic evaluation of the cowbirds' effect on their hosts can be reached by discounting the seven parasitized nests that were abandoned before a full clutch was laid, and where the phoebes immediately renested. This reduces the total number of parasitized nests considered from 23 to 16. The observed mean clutch size for these 16 parasitized nests is 3.0, but the true mean is probably very close to the mean of 4.2 eggs for unparasitized nests. This removal of around 1.2 eggs per parasitized nest leads me to estimate conservatively that 15-20 additional phoebe eggs were lost, reducing the actual percentage of phoebe fledging success to 8.8% - 9.5%, rather than 12.5%. Any way you compute it, the phoebe is coming off badly.

It is obvious that cowbirds are causing one half of the losses by interfering with one third of the nests, making them the greatest single destructive agent during the entire nesting season, predation parasites and pollution notwithstanding. Norris' figures (1947) for 14 species cannot be compared because he did not give a detailed breakdown of egg success by parasitized and unparasitized nest.

Bent (1940) quotes Bendire (1895) as saying "Occasionally they build a new nest on top of the old one, and this is sometimes done to get rid of cowbirds' eggs that may have been deposited by these intruders, but ordinarily they do not appear to object much to such additions, and care for them as faithfully as if they were their own." This is not entirely true. In the present study, of seven abandoned nests containing one or more cowbird eggs, five contained one cowbird egg and no phoebe eggs, one contained one cowbird egg and one phoebe egg, and one contained four cowbird eggs and one phoebe egg. The only case of roofing over noted was the nest containing one cowbird egg and one phoebe egg. One clutch consisting of two cowbird eggs was incubated. It appears the phoebe is usually reluctant to incubate if her eggs are badly outnumbered, or unless some of her own eggs are there. The cowbird that strikes too soon will be unsuccessful.

Norris also noted that "Most host species would accept a single cowbird egg when it was not laid prematurely with reference to the host's clutch. But nests in which a cowbird egg was laid before the host's clutch was begun and nests in which more than one cowbird egg was laid were usually deserted."

With the greater number of cowbird eggs lost, it would appear that the phoebe is not a choice host. However, it is possible to compare figures from the present study with Norris' figures for all parasitized species, as shown in Table 2.

Table 2. Cowbird Success

	Total Nests	Parasitized Nests	Nests with			
			1	2	3	4
			Cowbird Eggs			
Eastern Phoebe (1974)	71	23 (32.2%)	16	5	1	1
All hosts (1947)	237	73 (30.8%)	45	21	7	0
	Cowbird Eggs		Cowbirds			
	Laid	Hatched	Fledged			
Eastern Phoebe (1974)	33	17 (51.5%)	15	(45.5%)		
All hosts (1947)	108	46 (42.6%)	29	(26.8%)		

The 18 cowbird failures were caused by abandonment (10), failure of egg to hatch (4), removal of egg by host (1), disappearance of egg (1), death of young in nest (1), and removal of young by another young cowbird (1). Despite these losses, it appears that the phoebe is a relatively good bet for the cowbird. Norris found only 4 of the 14 species he studied to be better hosts, none of them significantly so.

Percentages of nests containing different numbers of cowbird eggs seem to be similar for all hosts, and agree very closely with Nice's (1939) data from 98 Song Sparrow nests over a 7-year period: 70.5% with one egg, 26.5% with two eggs, and 3% with three. To find four or more cowbird eggs in a single nest is unusual. I could not determine whether or not my case of four was the work of more than one cowbird, but the case of three in one nest appeared to be the work of two cowbirds.

The incubation period (about 12 days), and time spent as a nestling (about 10 days) agreed with Bent's data (1958).

It is not entirely fair or accurate to measure the effect of cowbird parasitism in terms of nest success only. Immediate renesting usually follows abandonment or other failure, and multiple nestings are common. I feel the summary in Table 3 is closer to measuring the true effect by measuring the number of young produced in a season by nesting pairs rather than in each individual nesting. Note also under "Attempts Incubated" that there is a tendency for the parasitized pairs to try harder. Perhaps the shorter incubation and nestling periods of cowbirds are less likely to satisfy the phoebe's "breeding instinct."

Table 3. Pair Production

	<u>Pairs</u>	<u>Nesting Attempts</u>	<u>Attempts Incubated</u>	<u>Total Young/Season</u>	<u>Avg/Pair Season</u>
Parasitized	20	46	37	72	3.60
Non Parasitized	17	25	22	84	4.95

Therefore, each case of brood parasitism against a nesting pair of Eastern Phoebes produced, on the average, a loss of 1.35 young. For the study area at Seneca Army Depot in the summer of 1974, it meant a loss of 27 Eastern Phoebes to produce a total of 15 Brown-headed Cowbirds. Most bird lovers wouldn't think that is much of a trade.

Norris' figures for individual nests of 14 species showed an average of 2.94 host nestlings for unparasitized nests, and 2.05 for parasitized nests, a loss of about one host young for each cowbird attempt. Obviously, the phoebe is not coming off nearly as well. Similar calculations led to Porter's heated demand (1919) that cowbirds be exterminated.

LITERATURE CITED

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Morgan Jones, a Lieutenant Colonel in the U. S. Army and a mechanical engineer by training, has been stationed at Seneca Army Depot since 1972 with his wife and two children. He is an active field birder whose main interests are behavior, breeding biology and population dynamics. He refers to the birds described in this article as a "target of opportunity" that was too fascinating to pass up.

APPENDIX 1

EASTERN PHOEBE

- DATE OF FIRST EGG -

SENECA ARMY DEPOT

1974

□ - UNPARASITIZED
 ▨ - PARASITIZED

