Articles

Cowbird Parasitism of House Finches at Guelph, Ontario

Rohan van Twest

Introduction

Since its release on Long Island, New York in 1940, the House Finch (*Carpodacus mexicanus*) has spread over much of the eastern United States and southeastern Canada (Hill 1993). Colonization of Ontario began in the mid 1970s, and its natural history in the province has been previously described by Kozlovic (1994) and Tozer (1997).

In Guelph, Wellington County, Ontario, the first House Finch was reported in 1975 (Brewer 1977). The next recorded occurrence was in 1983 (van Twest 1991), and nesting was confirmed in the spring of 1985 (Weir 1985). Graham (1987) found that the frequency of nest parasitism by the Brown-headed Cowbird (*Molothrus ater*) in this pioneering House Finch population was high (88%). Moreover, 42% of Ontario House Finch nests were subject to cowbird parasitism (Ontario Nest Records Scheme, Peck and James 1987). Despite the high frequency of brood parasitism of its nests, the House Finch is now a common resident at Guelph.

During the breeding season (April to June) of 1994 and 1995, I conducted a study at Guelph to determine the level of cowbird parasitism on House Finches, and to monitor the fate of parasitized and unparasitized nests.

Methods

Between 17 April and 30 June, nests were found by systematically searching through an area approximately 10 km^2, in the northwestern sector of the City of Guelph. This area consisted of a mosaic of residential (60%), industrial (30%) and commercial (10%) development. Nests subsequently were visited daily until the young fledged from the nest or it was destroyed or abandoned. The nest contents were examined with the aid of an adjustable mirror mounted on a 1.5 m pole. If the clutch or brood was not attended continually by the pair for 3 days, it was deemed abandoned. A nest was considered parasitized if it contained a cowbird egg or nestling.

Results and Discussion

Due to the conspicuous nesting behaviour of House Finches, nests were easily detected. However, not all nests were readily accessible and therefore, contents could not be

checked. A total of 166 nests was monitored. Of these, 19 were parasitized, 16 were found with cowbird eggs, and 3 with cowbird nestlings. Nest outcomes for unparasitized and parasitized House Finch nests are summarized in Table 1.

Table 1: House Finch nest outcomes at Guelph, Ontario.

	Abandoned # (%)	**Destroyed** # (%	**Fledge**
Unparasitized nests n = 147	43 (29.3)	33 (22.4)	71 (48.2)
Parasitized nests n = 19	8 (42.1)	5 (26.2)	6 (31.6)

House Finch nests had a mean finch clutch size of 4.6 (n = 131, sd = 0.61) and 4.4 (n = 12, sd = 0.90) in unparasitized and parasitized nests, respectively. Parasitized nests had a mean of 1.5 cowbird eggs (n = 12, sd = 0.91) and a combined mean clutch size of 5.9 (n = 12, sd = 1.08). Although female cowbirds are known to reduce finch clutches by removing eggs (Kozlovic 1998), there was no significant difference ($t = 0.99$, $df = 141$, $p > 0.05$) between finch clutch sizes in unparasitized and parasitized nests. The female cowbird often reduces the host's clutch size to ensure its own eggs are adequately incubated and hatch before the host eggs. However, this process appears unnecessary for small hosts such as the House Finch, as it has no effect on the length of incubation of the cowbird eggs (Peer and Bollinger 2000).

Parasitized nests that reached the fledgling stage produced a mean of 1.8 finches per nest (n = 6, sd = 0.69), compared to a mean of 3.7 finches per nest (n = 79, sd = 1.27) in unparasitized nests. Therefore, parasitism resulted in significantly ($t = 3.52$, $df = 85$, $p < 0.001$) lowered production of House Finches. This loss in productivity may be comparatively greater at Guelph than that reported in St. Catharines (Kozlovic et al. 1996), as some of the nestling cowbirds survived more than 3 days in the finch nests, and thus competed for food and space with their nestmates (Payne 1977), which may have led to increased House Finch mortality.

House Finches usually feed their young predominantly plant material, which is apparently an inappropriate diet for cowbirds, with the result that few if any cowbirds survive to fledge from House Finch nests (Kozlovic et al. 1996). At Guelph, only 2 (n = 8) nestling cowbirds disappeared between 3 to

Figure 1: Nestling Brown-headed Cowbird in House Finch nest, 18 June 1995, Guelph, Ontario. Photo by *Rohan van Twest*.

5 days after hatching; 2 survived for at least 5 days, but their nests were destroyed; and a single nestling cowbird survived for 10–12 days, but fell out of the nest and died. This carcass was collected, and the following measurements were made: total body length (74 mm), wing length (45 mm), tarsus (20 mm), and alar feather tract length (24 mm). These measurements indicate that this nestling cowbird's growth was retarded and equivalent to a 6–7 day old with a normal host (Scott 1978). The 3 remaining nestling cowbirds apparently fledged, but only one was located after leaving the nest, and was followed for up to 6 days. The chronology and observations for this young cowbird are summarized in Table 2.

Table 2: Chronology and observations of a parasitized House Finch nest in 1995 at Guelph, Ontario.

Date	Observations
28 May	1 cowbird egg and 5 finch eggs (one slightly cracked); nest in Sky Rocket Juniper (*Juniperus* sp.)
5 June	1 cowbird nestling (N) and 2 finch nestlings (N); 2 finch eggs
8 June	1 cowbird N and 3 finch N; 1 finch N dead on ground; 1 finch egg
12 June	1 cowbird N and 2 finch N; 1 finch N live on ground
15 June	1 cowbird N and 1 finch N; 1 finch N dead on ground
18 June	1 cowbird N and 1 finch N; nest photographed (Figure 1)
19 June	Cowbird young's begging call heard, but not located; finch fledgling in nest-tree and was fed by male parent.
21 June	Begging calls of the cowbird young heard and located in a maple (*Acer* sp.) tree, close to original nest-tree. Foster parents agitated by my presence; observed male foster parent feed the cowbird. Finch fledgling flew out of nest-tree and was followed by the parents.
24 June	Cowbird young still in maple tree, alert and able to fly higher into crown of the tree by flapping and hopping. Wings appear to be fully developed, but the head and body still not fully feathered. A patch of fecal "white wash" on ground below the perch, indicating that the cowbird had received sufficient food.
25 June	Cowbird and finch gone.

Fledgling cowbirds often give loud and persistent begging calls that occasionally elicit feeding by conspecific non-foster parents (Woodward 1983). Although the successfully fledged cowbird was not banded or marked for individual identification, its features and the circumstances strongly suggested that it was fed by its foster parent. This observation is interesting, as there is only one other published instance of a young cowbird being fed by a House Finch (reported in the Panamint Mountains, California by Wauer 1964). However, departure of single cowbirds from House Finch nests has been recorded at St. Catharines, Ontario (Kozlovic et al. 1996) and at Ithaca, New York (Hartup et al. 2000). Nevertheless, the House Finch is an ineffective host as there is no report of a fledgling cowbird being raised to independence, a process that can take 16–28 days after the young leave the nest (Woodward 1983).

The incidence of parasitism was 11.4% (n = 166), which is drastically lower than the 88% reported by Graham (1987), nearly ten years before this study. A reduction in the frequency of parasitism over time also has been found in southern Ontario and the eastern United States (Peck and James 1998; Kozlovic, pers. comm.). In the native western range of the House Finch, where the host and parasite have been in sympatry for longer

than in Ontario, the frequency of parasitism is only 1% (Wootton 1986). Moreover, the incidence of parasitism is generally lower in hosts that feed their young granivorous (Middleton 1991) and frugivorous (Rothstein 1976) diets. Therefore, the decline in cowbird parasitism of House Finch nests in Guelph and Ontario is perhaps predictable.

Cowbird parasitism decreases the reproductive output from House Finch nests by reducing finch clutch sizes (Kozlovic 1998) and by reducing the number of young fledging (this study). Therefore, there must be selective pressure on the host to evolve measures that reduce the frequency of parasitism. Small hosts are known to use clutch abandonment as a principal mode of defence to counter parasitism (Graham 1988). At Guelph, parasitized nests apparently were abandoned by finches more frequently than unparasitized nests (see Table 1); however, the difference was not significant ($z = -1.14$, $df = 164$, $p = 0.25$). This may suggest that for House Finches nest abandonment has not developed as a significant defence against cowbird parasitism. Because House Finches can raise some of their own young in parasitized nests, it may be that the cost of abandoning their clutch is greater than accepting cowbird eggs. Therefore, host clutch abandonment alone cannot account for the observed decline in the frequency of brood parasitism. However, as House Finches have a protracted egg-laying season, which ranges from 22 March to 6 August, and the peak nesting season for cowbirds is from May to July in Ontario (Peck and James 1998), some House Finches may be able to escape the negative effects of parasitism by nesting outside the peak cowbird breeding season.

Similarly, female cowbirds that include House Finches among their complement of hosts would produce comparatively fewer offspring than female cowbirds that do not parasitize House Finches. Thus, selective pressure probably operates on cowbirds to avoid parasitizing House Finches and may partly explain the observed decline in the frequency of brood parasitism.

Another factor worthy of consideration is the relative abundance of the host and parasite. The importance of relative abundance in reducing the rate of parasitism in endangered species such as the Kirtland's Warbler (*Dendroica kirtlandii*) and the Black-capped Vireo (*Vireo atricapillus*) has been shown with cowbird control programs (Rothstein and Cook 2000). In Ontario, from 1985 to 1995, the abundance trend for House Finches and cowbirds was +45.6% and -5.2% per year, respectively (North American Breeding Bird Survey Trend Estimates: http://www.mbr-pwrc.usgs.gov/bbs/trend/tf98.html). These trends would suggest that more House Finches were available as potential hosts to a declining pop-

ulation of cowbirds, and could have played a role in reducing the frequency of brood parasitism of House Finches in Guelph and Ontario.

Acknowledgements

I thank the participants of the Guelph House Finch Count for providing information on nests, the proprietors in the City of Guelph for granting me permission to access nests on their properties, and Dr. Sandy Middleton for his constructive comments on an earlier draft of this paper.

Literature Cited

Brewer, A.D. 1977. The birds of Wellington County. Special Publication. Guelph Field Naturalists Club, Guelph, Ontario.

Graham, D.S. 1987. Frequent cowbird parasitism of House Finches (*Carpodacus mexicanus*) at Guelph, Ontario. Ontario Birds 5: 116–117.

Graham, D.S. 1988. Response of five hosts to cowbird parasitism. Condor 90: 588–591.

Hartup, B.K., G.V. Kallias, and D.H. Ley. 2000. Mycoplasmal conjunctivitis in songbirds from New York. Journal of Wildlife Disease 36: 257–264.

Hill, G.E. 1993. House Finch (*Carpodacus mexicanus*). *In* The Birds of North America, No. 46 (A. Poole and F. Gill, editors). Academy of Natural Sciences, Philadelphia, and American Ornithologists' Union, Washington, D.C.

Kozlovic, D.R. 1994. The House Finch in Ontario. Pp. 298–306 *in* Ornithology in Ontario (M.K. McNicholl and J.L. Cranmer-Byng, editors). Special Publication No. 1. Ontario Field Ornithologists, Toronto.

Kozlovic, D.R. 1998. Parasitism by Brown-headed Cowbird and productivity of House Finch hosts. Canadian Journal of Zoology 76: 1721–1747.

Kozlovic, D.R., R.W. Knapton, and J.C. Barlow. 1996. Unsuitability of the House Finch as a host of the Brown-headed Cowbird. Condor 98: 253–258.

Middleton, A.L.A. 1991. Failure of Brown-headed Cowbird parasitism in nests of the American Goldfinch. Journal of Field Ornithology 62: 201–203.

Payne, R.B. 1973. The breeding season of a parasitic bird, the Brown-headed Cowbird, in central California. Condor 75: 80–99.

Peck, G.K. and R.D. James. 1987. Breeding Birds of Ontario: Nidiology and Distribution. Volume 2: Passerines. Life Sciences Miscellaneous Publications, Royal Ontario Museum, Toronto.

Peck, G.K. and R.D. James. 1998. Breeding Birds of Ontario: Nidiology and Distribution. Volume 2: Passerines (first revision Part C: Tanagers to Old World Sparrows). Ontario Birds 16: 111–127.

Peer, B.D. and E.K. Bollinger. 2000. Why do female Brown-headed Cowbirds remove host eggs? A test of the incubation efficiency hypothesis. Pp. 187–192 *in* Ecology and Management of Cowbirds and Their Hosts (J.N.M. Smith, T.L. Cook, S.I. Rothstein, S.K. Robinson, and S.G. Sealy, editors). University of Texas Press, Austin, Texas.

Rothstein, S.I. 1976. Cowbird parasitism of Cedar Waxwing and its evolutionary implications. Auk 93: 498–509.

Rothstein, S.I. and T.L. Cook. 2000. Cowbird management, host population limitation, and efforts to save endangered species. Introduction. Pp. 324–332 *in* Ecology and Management of Cowbirds and Their Hosts (J.N.M. Smith, T.L. Cook, S.I. Rothstein, S.K. Robinson, and S.G. Sealy, editors). University of Texas Press, Austin, Texas.

Scott, I.W. 1979. Growth and age determination of nesting Brown-headed Cowbirds. Wilson Bulletin 91: 464–466.

Tozer, R. 1997. House Finch population trends in Ontario. Ontario Birds 15: 89–94.

van Twest, R. 1991. Winter birds of Guelph and Wellington County. Special Publication. Guelph Field Naturalists Club, Guelph, Ontario.

Wauer, R.H. 1964. Ecological distribution of the birds of the Panamint Mountains, California. Condor 66: 287–301.

Weir, R.D. 1985. The spring migration. Ontario region. American Birds 39: 291–296.

Woodward, P.W. 1983. Behavioral ecology of fledgling Brown-headed Cowbirds and their hosts. Condor 85: 151–163.

Wootton, J.T. 1986. Clutch-size difference in western and introduced populations of House Finches: patterns and hypothesis. Wilson Bulletin 98: 459–462.

Rohan van Twest, 68 Memorial Crescent, Guelph, Ontario N1H 6B9

OFO Annual General Meeting
Point Pelee National Park
29 and 30 September 2001

Be sure to attend this great weekend of fall birding. Join experienced OFO birders Gavin and Ian Platt, Paul Pratt, Pete Read, Ron Tozer and Alan Wormington who will lead field trips with a focus on bird identification to Point Pelee and nearby hotspots. The Saturday evening banquet at the Leamington Dock Restaurant will feature a special presentation on **Hawk Migration and Hawk Identification** by Allen Chartier, plus the OFO Distinguished Ornithologist Award and "Birds of the Gulf of Mexico" by Alan Wormington. Watch for registration details in the June *OFO News*.