*The Condor* 88:381–382


# ATTEMPTED NEST PARASITISM OF THE MARSH WREN BY A BROWN-HEADED COWBIRD[1]

JAROSLAV PICMAN
*Department of Biology, University of Ottawa, 30 Somerset E., Ottawa, ON K1N 6N5, Canada*

*Key words: Brown-headed Cowbird;* Molothrus ater; *Marsh Wren;* Cistothorus palustris; *nest parasitism.*

The Brown-headed Cowbird, *Molothrus ater,* is a brood parasite known to have laid in nests of 220 host species (Friedmann et al. 1977, Friedmann and Kiff 1985). The Brown-headed Cowbird is a generalist that tends to parasitize passerines building open nests, although relatively rare cases of parasitism of hole-nesting species such as the House Wren, *Troglodytes aedon,* have been reported (Friedmann et al. 1977). The purpose of this note is to describe the first case of cowbird parasitism of the Marsh Wren, *Cistothorus palustris,* and hence add this passerine to the list of the cowbird hosts.

The Marsh Wren is a small (about 12 g) passerine breeding in marshes across temperate North America. Male wrens build many domed nests, each with a small entrance (about 3 cm in diameter) near the top, concentrated in the courtship sites (e.g., Verner 1965). The female usually chooses one of these "courtship" nests for breeding, lines it, and then lays a clutch that she alone incubates (Verner 1965).

From 1977 through 1982 I collected data on the breeding ecology of Marsh Wrens in a brackish water marsh on Westham Island, Delta, B.C., Canada, and obtained information on over 1,200 breeding nests. On 26 June 1981 I found a Marsh Wren nest that contained two broken wren eggs and one cold, undamaged cowbird egg. The nest was not damaged; i.e., the entrance near the top of this domed structure was not enlarged. Because the entrances into Marsh Wren nests are presumably too small to allow entry by cowbirds, the female cowbird had to lay an egg by perching on the nest top, placing her cloaca near the entrance, and depositing an egg.

My data on Marsh Wrens suggest that cowbird parasitism of this host is extremely rare. The probability that some parasitized nests escaped detection is very low, because contents of all nests were checked twice a week throughout each season by inserting a forefinger through the entrance and touching the eggs or young. Because cowbird eggs are larger (21.5 × 16.5 mm) than those of Marsh Wrens (16 × 12 mm), it is unlikely that observers would have failed to detect them. In addition, none of the Marsh Wren nests ever contained a cowbird chick, although this could have been the result of the rejection of cowbird eggs by this host. Unfortunately, it is not known whether Marsh Wrens are accepters or rejecters (see Rothstein 1975). The lack of any reports on cowbird parasitism of Marsh Wrens that were the subject of four additional extensive studies (Kale 1965; Verner 1965; Verner and Engelsen 1970; M. Leonard, pers. comm.) further suggests that cowbird parasitism of this species is very unusual.

The low rate of parasitism of Marsh Wren nests by cowbirds indicates that Marsh Wrens are an unsuitable host. At least four features of Marsh Wren ecology should make them unattractive for cowbirds. First, Marsh Wren nests are domed with a small entrance that prevents cowbirds from entering them and, perhaps even more importantly, this domed shape conceals the nest contents (successful parasitism requires that a female cowbird lay an egg in the host nest at an appropriate time; Clark and Robertson 1981, Burgham 1985). This proposition is supported by generally rare reports of cowbird parasitism of small hole-nesting passerines such as the Tree Swallow *Tachycineta bicolor,* Black-capped Chickadee *Parus atricapillus,* Carolina Chickadee *Parus carolinensis,* and Brown Creeper *Certhia familiaris* (see Friedmann and Kiff 1985). Second, Marsh Wrens may benefit from the presence of Red-winged Blackbirds, *Agelaius phoeniceus,* which also inhabit marshes and whose colonial nesting and high level of aggression may provide effective defense against cowbird parasitism (see Clark and Robertson 1979). This idea is supported by the fact that although cowbirds were common near my study area, only 3 of approximately 1,400 redwing nests that I found from 1976 through 1982 contained a cowbird egg. Third, the presence of a large number of redwings, which build open nests and are presumably a more suitable host, might reduce chances of cowbird parasitism of Marsh Wrens. However, this hypothesis does not provide a plausible explanation for the above case of attempted parasitism of Marsh Wrens, because this case occurred late in the season when most redwings had already departed from the marsh, and because cowbird parasitism of redwings in this marsh is very rare. And finally, the generalized egg-pecking behavior exhibited by Marsh Wrens (Picman 1977) could be considered as a preadaptation making rejection of cowbird eggs through ejection likely to evolve. However, this hypothesis requires that we examine the Marsh Wren responses to cowbird eggs by experimentally introducing them into wren nests.

To conclude, the Marsh Wren appears to be an unsuitable host presumably because of its domed nests with small entrance holes and possibly also because of its association with co-occurring Red-winged Blackbirds, which provide effective protection from cowbird parasitism.

I would like to thank the Canadian Wildlife Service and Mrs. V. Robertson for permission to work on their properties. It is a pleasure to thank D. Goodwin, A. K. Picman, M. Taitt, and P. Thompson for assistance with field work. M. Burgham, H. W. Kale, M. Leonard, and an anonymous reviewer provided constructive comments on this manuscript. This work was supported by NSERC Operating grants to C. L. Gass and J. Picman.

## LITERATURE CITED

BURGHAM, M. 1985. The impact of brood parasitism by the Brown-headed Cowbird on the reproductive tactics of the Yellow Warbler. M.Sc.thesis, University of Ottawa, Ottawa, ON, Canada.

CLARK, K. L., AND R. J. ROBERTSON. 1979. Spatial and temporal multi-species nesting aggregations in birds as anti-parasite and anti-predator strategies. Behav. Ecol. Sociobiol. 5:359–371.

CLARK, K. L., AND R. J. ROBERTSON. 1981. Cowbird parasitism and evolution of anti-parasite strategies in the Yellow Warbler. Wilson Bull. 93:249–258.

[1] Received 9 September 1985. Final acceptance 3 January 1986.

FRIEDMANN, H., L. F. KIFF, AND S. I. ROTHSTEIN. 1977. A further contribution to knowledge of the host relations of the parasitic cowbirds. Smithson. Contrib. Zool. 235:1–75.

FRIEDMANN, H., AND L. F. KIFF. 1985. The parasitic cowbirds and their hosts. Proc. West. Found. Vertebr. Zool. 2:227–303.

KALE, H. W. 1965. Ecology and bioenergetics of the Long-billed Marsh Wren, *Telmatodytes palustris griseus* (Brewster), in Georgia salt marshes. Nuttall Ornithological Club Publ. No. 5.

PICMAN, J. 1977. Destruction of eggs by the Long-billed Marsh Wren (*Telmatodytes palustris palustris*). Can. J. Zool. 55:1914–1920.

ROTHSTEIN, S. I. 1975. An experimental and teleonomic investigation of avian brood parasitism. Condor 77: 250–271.

VERNER, J. 1965. Breeding biology of the Long-billed Marsh Wren. Condor 67:6–30.

VERNER, J., AND G. H. ENGELSEN. 1970. Territories, multiple nest building, and polygyny in the Long-billed Marsh Wren. Wilson Bull. 47:3–34.

*The Condor* 88:382–384


# THE DAILY ACTIVITY PERIOD OF NESTING WHITE-CROWNED SPARROWS IN CONTINUOUS DAYLIGHT AT 65°N COMPARED WITH ACTIVITY PERIOD AT LOWER LATITUDES[1]

JAMES R. KING
*Department of Zoology, Washington State University, Pullman, WA 99164*

*Key words: Daily activity cycles; White-crowned Sparrows;* Zonotrichia leucophrys; *time budgets.*

Time-and-activity budgets attempt to express how animals allocate time to vital activities such as foraging, courtship, and territorial defense. The baseline of an activity budget is the duration of an animal's voluntary activity period per 24-hr cycle. An accurate estimate of this period is therefore an indispensable element of the budget, as Hussell (1985) recently emphasized in an analysis of the correlation between clutch size and daylength or activity period. Daan and Aschoff (1975) found that the daily activity span of captive finches is a shallow sigmoidal function of civil daylength, so that the activity span is nearly the same as daylength at middle values (ca. 8 to 16 hr) but is longer than daylength when days are very short and shorter when days are very long. For instance, captives are active for 17 to 18 hr per day in continuous daylight. In the handful of cases in which comparisons are possible, free-living birds reflect fairly closely the daily activity span in relation to daylength found in captives (cf. Armstrong 1954, Aschoff 1969, Daan and Aschoff 1975). Analysis of my own field records and of published reports yielded a reasonably detailed picture of the daily activity cycle in a subarctic breeding population of White-crowned Sparrows (*Zonotrichia leucophrys*) and estimates of their daily activity span in localities at lower latitudes where midsummer cycles of daylight and darkness are clear-cut. These data help in designing realistic experiments with captives and in analyzing the time budgets of free-living birds.

## MATERIALS AND METHODS

The majority of the original data reported herein were obtained from *Zonotrichia leucophrys gambelii* near Fairbanks, Alaska (64°51′N, 147°52′W), during the breeding seasons of 1962 through 1965, 1967 to 1968, and 1972. Daylight (civil daylength plus civil twilights) is continuous from 16 May to 28 July at this latitude. Male White-crowned Sparrows usually arrive in the second week of May, females about one week later. Nesting is very well synchronized in the population. Except for unusual renestings following loss of a nest, young have left the nest by 1 July, when postnuptial molt begins in all but failed nesters. Southward migration begins soon after mid-August (King et al. 1965, 1966; Wingfield and Farner 1979).

A few comparative data were available also from *Z. l. oriantha* at Tioga Pass, California, Niwot Ridge, Colorado, and Hart Mountain, Oregon. See King and Hubbard (1981) for details about these localities. All lie between 38°N and 42°N, and hence have similar daylengths.

Measures of activity used herein include (1) incidence of singing, (2) records of periods in which White-crowned Sparrows could not be heard or found in the study area, and (3) observation of the schedules of parents feeding nestlings. Except for the latter (1972 only), the results are presented as a composite of data from the six earlier years, all from the same sample site. My assistants and I routinely counted the number of White-crowned Sparrow songs heard in a 10-min sample of every hour that we were afield. During the twilight hours we recorded the times in which we could neither see nor hear White-crowned Sparrows in the study area, and in 1972 we systematically searched for males during the quiescent period (when females were incubating or brooding and therefore known to be inactive).

## RESULTS AND DISCUSSION

### ACTIVITY PERIOD AT FAIRBANKS

White-crowned Sparrows can be heard singing at nearly any time of the day during the nesting season at Fairbanks, although there is a consistent lull lasting about 3.5 to 4 hr before midnight and a shorter lull centered at about 1530 (Fig. 1). This pattern is repeated from year to year and is not an artifact of merged data. The daily cycle of song intensity reflects the number of singers rather than the

[1] Received 9 September 1985. Final acceptance 3 January 1986.