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## Catalog of Brown-headed Cowbird Hosts from Iowa

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# Catalog of Brown-headed Cowbird Hosts from Iowa

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A survey of literature, egg collections and field data produced a list of 60 species that have served as hosts of the brood parasitic Brown-headed Cowbird in Iowa. About 52 of these species are known to have reared cowbird young. In Iowa, those species most commonly parasitized — in absolute numbers — include Red-winged Blackbirds, Dickcissels, Common Yellowthroats and Song Sparrows. An additional 36 species are listed which nest in Iowa but have not yet been recorded as cowbird hosts in the state even though they have served as cowbird hosts elsewhere.

INDEX DESCRIPTORS: Brood parasitism, Brown-headed Cowbird, cowbird hosts, Iowa, *Molothrus ater*

The Brown-headed Cowbird (*Molothrus ater* [Boddaert]) is a wide-ranging brood parasite in North America. The species is not host specific, thus cowbirds interact with geographically varying host communities. Friedmann (1929, 1963, 1971, Friedmann et al. 1977) has compiled host records for cowbirds and most recently listed over 200 species that have had cowbird eggs in their nests. Friedmann indicated regional differences in host communities by listing states and provinces from which parasitism records came. I have consolidated the Iowa records from Friedmann's works and have added new records of cowbird hosts in Iowa. In addition to reports from the literature, data from the collections of 7 museums have provided Iowa records (see Acknowledgements for abbreviations) and Iowa's Nest Record Card Program has reports on 152 parasitized nests collected through 1982 (Newhouse and Ehresman 1982, 1983).

In an early account of the birds of Iowa, Savage (1894a) provided a list of 31 host species compiled from information provided by J. E. Law, R. M. Anderson, J. V. Crone and himself. Later (Savage 1897) he gave an account of his acquaintance with Brown-headed Cowbirds in Henry County. He listed 25 species of cowbird hosts and reported extreme dates of cowbird egg laying activity as 22 April and 27 July. Anderson (1907) added 10 species to Savage's (1897) host list. Studies of cowbirds and their hosts in Iowa are few and are limited often to anecdotal reports or observations incidental to studies of other species.

Brown-headed Cowbirds are common in Iowa (Dinsmore 1981; Table 1). Despite their abundance, their breeding biology has been little studied in the state (see species accounts below). To some extent, this is understandable since cowbirds are brood parasites and their nesting efforts are scattered about in the nests of many host species. This consolidation of cowbird host records can serve as a recent reference for field workers in the state and encourage observations and reports on the breeding biology of Brown-headed Cowbirds and their interactions with host species.

Of the many species recorded as cowbird hosts, those most important — in terms of numbers of cowbird young reared — are likely common species. Dinsmore (1981) listed the most common species recorded on Breeding Bird Survey routes in Iowa. Among the passerines on this list (Table 1) are 6 species that are likely the most important hosts in Iowa for nesting cowbirds. Only for two species are there Iowa data on cowbird-host interactions. Data are skimpy for the other four species but on the basis of other midwest studies these species are likely important cowbird hosts in Iowa. These species (and studies which have shown their interactions with cowbirds) are Red-winged Blackbird (see account below), Dickcissel (Zimmerman 1983), Common Yellowthroat (Hofslund 1957), Song Sparrow (Nice 1937), Eastern Meadowlark (Elliott 1978), and Vesper Sparrow (see account below).

## SPECIES ACCOUNTS

In the following accounts, my citation of Friedmann refers primari-

ly to his 1963 work with additional data from Friedmann (1971) and Friedmann et al. (1977). Often, not much more than "... Iowa ..." appears in Friedmann's accounts but any specific citation he gave I also include below. Each species account begins with a notation indicating total number of parasitism records tabulated by Friedmann and frequency at which the species has been noted to rear cowbird young (cf. Friedmann 1963:39-41). In addition, Iowa Nest Record Card data are summarized briefly. A species account may begin, for example, with F: 57, 2; NC: 2 of 18. This would mean Friedmann compiled 57 records of parasitism and 2 cases of cowbird young being reared and of 18 nest cards, 2 were of parasitized nests. In most cases, Friedmann described incidence of rearing cowbird young as "frequently" or "several times" rather than giving an actual number. Details of parasitism records known from Iowa comprise the remainder of each species' account.

Mourning Dove, *Zenaidura macroura* (Linnaeus). — F: 8, 0; NC: 0 of 378. Friedmann cited Coues' (1884) report of a parasitism record from Iowa.

Eastern Wood-Pewee, *Contopus virens* (Linnaeus). — F: 50+, 0; NC: 0 of 1. Savage (1894a, 1897) listed the Eastern Wood-Pewee as an Iowa host.

Acadian Flycatcher, *Empidonax virens* (Vieillot). — F: 45, "several times"; NC: 1 of 18. The nest card record is of a nest found by D. D.

Table 1. List of most common passerines in Iowa based on Breeding Bird Survey (F&WS) data (Dinsmore 1981).

| Species                     | Birds/<br>route | Comments                                 |
|-----------------------------|-----------------|--|
| House Sparrow               | 176.4           | Not host due to habitat, cavity nest     |
| Red-winged Blackbird        | 172.0           |  |
| Western Meadowlark          | 69.2            |  |
| Dickcissel                  | 62.0            |  |
| European Starling           | 60.2            | Not host due to habitat, cavity nest     |
| Common Grackle              | 57.0            | Not host due to ?                        |
| Barn Swallow                | 32.2            | Not host due to habitat or nest location |
| American Robin              | 31.5            | Not host due to ?; ejector               |
| Common Yellowthroat         | 24.7            |  |
| American Crow               | 22.6            | Not host due to large size               |
| <b>BROWN-HEADED COWBIRD</b> | 20.5            |  |
| Song Sparrow                | 17.6            |  |
| Eastern Meadowlark          | 15.6            |  |
| Horned Lark                 | 14.7            |  |
| House Wren                  | 14.6            | Not host due to cavity nest              |
| Vesper Sparrow              | 12.8            |  |
| American Goldfinch          | 11.6            | Not host due to late season nesting      |

Koenig in Van Buren County on 29 May 1979.

Willow Flycatcher, *Empidonax traillii* (Audubon). — F: 150, "several times"; NC: 0 of 2. Most of Friedmann's records on "Traill's" Flycatcher refer to the Willow Flycatcher (Friedmann et al. 1977:13). In Iowa, Savage (1894a; Anderson 1907) described a nest with a buried cowbird egg. Lowther (1983) found 2 parasitized nests in Dickinson County.

Least Flycatcher, *Empidonax minimus* (Baird and Baird). F: 39, 0; NC: 0 of 0. Iowa's mention in Friedmann's account was based, probably, on R. M. Anderson's host list (in Savage 1894a) and his later work (Anderson 1907).

Eastern Phoebe, *Sayornis phoebe* (Latham). — F: 600, "frequently"; NC: 0 of 8. Published accounts of phoebes as hosts include Brown (1964), Hodges (1954), and Stoner (1919).

Eastern Kingbird, *Tyrannus tyrannus* (Linnaeus). — F: 24, 1; NC: 0 of 20. Savage (1894a:36, 1897:6) and Anderson (1907:299-300) listed Eastern Kingbirds as cowbird hosts. Lowther (1983) reported on one instance of parasitism in which the cowbird egg was ejected — a usual practice of kingbirds (Rothstein 1975) — and the nest deserted.

Horned Lark, *Eremophila alpestris* (Linnaeus). — F: 36, 1; NC: 0 of 2. Savage (1894a:34) noted that he would "often find one or more" cowbird eggs in nests he found. His later host list (Savage 1897) mentioned larks again. One egg set (WFVZ 74359) taken 4 May 1896 had 3 host and 2 cowbird eggs.

Barn Swallow, *Hirundo rustica* Linnaeus. — F: 9, 0; NC: 0 of 185. J. V. Crone (in Savage 1894a:36) listed Barn Swallows as a cowbird host, a record repeated by Anderson (1907:299).

Black-capped Chickadee, *Parus atricapillus* Linnaeus. — F: 6, 1; NC: 0 of 9. Lowther (1983) has reported on a chickadee pair that apparently reared 3 cowbird young plus 1 of their own.

House Wren, *Troglodytes aedon* Vieillot. — F: 6, 3; NC: 1 of 86. Friedmann included J. Hodges' report of wrens feeding a "recently fledged" cowbird young on 12 July 1947 in Scott County. The nest card record is of a wren nest found in Palo Alto County by S. W. Pitt on 15 June 1978.

Blue-gray Gnatcatcher, *Poliophtila caerulea* (Linnaeus). — F: 40+, "frequently"; NC: 0 of 4. Iowa records include a specific instance reported by Savage (1893) of a nest with 4 gnatcatcher and 1 cowbird eggs on 17 May 1893. Savage (1894a, 1897) included this species in his later host lists.

Eastern Bluebird, *Sialia sialis* (Linnaeus). — F: 50, 0; NC: 0 of 89. Keys and Williams (1888) listed bluebirds as a cowbird host as did J. E. Law (in Savage 1894a). G. Black found 5 nestboxes parasitized (Black 1966, Brown 1965). There are 2 museum egg sets of this species which include cowbird eggs — one from Dallas County (taken by J. E. Law; WFVZ 92683), the other from Hardin County (UAM 57-7-179).

Veery, *Catharus fuscescens* (Stephens). — F: 132, "frequently"; NC: 1 of 1. The nest card record is of a nest found by D. D. Koenig on 15 June 1977 in Fayette County.

Wood Thrush, *Hylocichla mustelina* (Gmelin). — F: 216, "several times"; NC: 0 of 2. Keys and Williams (1888) called this species "a favorite" host and specifically mentioned 6 parasitized nests. Stoner (1919, 1949) recorded another 12 instances of parasitism in Iowa. Green (1887) stated that half of the nests he found were parasitized but gave the contents of only 1 (with 2 thrush and 6 cowbird eggs). Savage (1894a, 1897) and Polderboer (1939) just listed Wood Thrushes as cowbird hosts.

American Robin, *Turdus migratorius* Linnaeus. — F: 44, 0; NC: 1 of 205. One Iowa record was of a robin that reared a young cowbird (Hodges 1949). The nest card record was from D. L. Prach who found a parasitized robin's nest in Lucas County on 14 May 1980. Both Savage (1894a, 1897) and Gabrielson (1914) listed robins as cowbird hosts but provided no specific details. American Robins usually eject

cowbird eggs (Rothstein 1975).

Gray Catbird, *Dumetella carolinensis* (Linnaeus). — F: 39, 2; NC: 3 of 97. J. E. Law (in Savage 1894a) listed catbirds as cowbird hosts as did Polderboer (1939). Johnson and Best (1980) found 1 nest (of a total of 37) parasitized; this egg was ejected by the catbirds, a usual practice of Gray Catbirds (Rothstein 1975). Dix (1936) reported on a parasitized catbird nest from which the cowbird egg was ejected.

Brown Thrasher, *Toxostoma rufum* (Linnaeus). — F: 79, "several times"; NC: 3 of 113. Baird et al. (1875) mentioned a thrasher nest that reared a cowbird; another nest that produced a cowbird was described by Lowther (1983). Keyes and Williams (1888), J. E. Law (in Savage 1894a), Stoner (1919) and Polderboer (1939) reported Brown Thrashers as cowbird hosts. Brown Thrashers usually eject cowbird eggs (Rothstein 1975).

Cedar Waxwing, *Bombycilla cedrorum* Vieillot. — F: 80, "several times"; NC: 1 of 8. The single nest card report by A. B. Thiermann added this species to Iowa's list of cowbird hosts. The nest was found on 25 June 1981 in Story County.

Bell's Vireo, *Vireo bellii* Audubon. — F: 147, "infrequently"; NC: 0 of 0. Bennett (1917) found 7 of 13 nests parasitized and Rosene (1941) noted 4 of 5 nests to have cowbird eggs. Stoner (1919) and Carter (1957a) also recorded Bell's Vireo as a cowbird host. One museum record exists of which I am aware (UAM 57-7-120).

Yellow-throated Vireo, *Vireo flavifrons* Vieillot. — F: 117, "frequently"; NC: 0 of 1. Savage (1894b) and Crone (1895) described parasitized nests; Anderson (1907, in Savage 1894a) included this vireo in his host list.

Warbling Vireo, *Vireo gilvus* (Vieillot). — F: 66+, "frequently"; NC: 0 of 1. J. V. Crone (in Savage 1894a) listed Warbling Vireos as a cowbird host in Iowa.

Red-eyed Vireo, *Vireo olivaceus* (Linnaeus). — F: 875+, "frequently"; NC: 0 of 1. Keyes and Williams (1888) vaguely referenced this host. Keyes (1888), J. E. Law (in Savage 1894a), Savage (1897) and Carter (1957b) noted Red-eyed Vireos as hosts. C. C. Smith (in Crone 1895:41) stated that "With the exception of the Chipping Sparrow, perhaps no bird is so imposed upon [by cowbirds] as this Vireo." In his account of Red-eyed Vireos, Crone (1895) mentioned the contents of 7 parasitized nests: 4 vireo and 1 cowbird egg (3 times), 3 and 1, 3 and 2, 3 and 3, and a nest with 2 and 1 on 12 June 1895 then 3 and 2 the next day. Two Iowa records are in museum collections (UAM 57-7-122, with 3 vireo and 1 cowbird egg, and PM E495.9).

Blue-winged Warbler, *Vermivora pinus* (Linnaeus). — F: 52, "several times"; NC: 0 of 0. Iowa's record of this warbler serving as a host is of a single nest from Henry County, taken on 2 June 1894, with 3 warbler and 2 cowbird eggs (Savage 1893, 1894a, 1897).

Yellow Warbler, *Dendroica petechia* (Linnaeus). — F: 1300, "frequently"; NC: 6 of 50. Keyes and Williams (1888) indicated that Yellow Warbler nests had as many as 3 cowbird eggs. C. R. Ball (in Savage 1894a:36) thought "the Yellow Warbler is imposed on the most [t]." J. V. Crone (in Savage 1894a) and Savage (1897) described this warbler as "often" serving as hosts to the Brown-headed Cowbird. Gabrielson (1914) and Stoner (1919) mentioned parasitized nests; the University of Arkansas Museum has 2 parasitized egg sets from Iowa. Studies on Yellow Warblers in Dickinson County (Kendeigh 1941, Lowther 1983, Schrantz 1943) found 22 parasitized nests out of 82 examined. Warblers buried cowbird eggs in 17 of these nests; 5 cowbird young were reared from 4 nests.

Chestnut-sided Warbler, *Dendroica pensylvanica* (Linnaeus). — F: 103, "frequently"; NC: 0 of 0. Two parasitism records from Poweshiek County exist. One is of a nest taken on 22 May 1886 by Lynds Jones with 3 warbler and 1 cowbird eggs (WFVZ 136880). More recently Koenig (1983) found a nest of this species on 21 July 1983 which contained a half grown nestling cowbird.

Black-and-white Warbler, *Mniotilta varia* (Linnaeus). — F: 40, "several times"; NC: 0 of 0. I could not find any specific Iowa

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references of this warbler as a cowbird host although Friedmann (1963) did mention "Iowa."

American Redstart, *Setophaga ruticilla* (Linnaeus). — F: 200, "frequently"; NC: 0 of 4. Specific Iowa records include Giddings (1897) and Savage (1894a, 1897).

Prothonotary Warbler, *Protonotaria citrea* (Boddaert). — F: 54, 0; NC: 0 of 0. Norris (1890) reported on 19 parasitized nests out of 41 taken at Burlington, Iowa. Contents of these 41 nests are as follows: 6 warbler and 0 cowbird eggs (11 nests), 7 and 0 (10), 8 and 0 (1), 4 and 4 (1), 5 and 3 (1), 6 and 1 (12), and 7 and 1 (5). [Walkinshaw (1953) gave a mean clutch size of 5.1 eggs, range 3 to 7 eggs, for Prothonotary Warblers in Michigan.] AMNH 14854 is a set taken at Muscatine with 3 warbler and 1 cowbird eggs.

Worm-eating Warbler, *Helminthos vermivorus* (Gmelin). — F: 37, 2; NC: 0 of 0. Savage (1897) recorded this warbler as a cowbird host.

Ovenbird, *Seiurus aurocapillus* (Linnaeus). — F: 280+, "frequently"; NC: 0 of 0. Jones (1888) reported that "never yet has a nest been found here [near Grinnell] but [with] two or more Cowbird's eggs . . ." Both Keyes and Williams (1888) and Savage (1894a, 1897) listed Ovenbirds as "often" parasitized. Marceau (1891) found one nest 25 May 1891 with 1 Ovenbird and 7 cowbird eggs.

Louisiana Waterthrush, *Seiurus motacilla* (Vieillot). — F: 86, "frequently"; NC: 1 of 3. Friedmann (1963) actually listed the Northern Waterthrush (*Seiurus noveboracensis* [Gmelin]) as a cowbird host in Iowa, but this citation is a repetition of an error in identification of waterthrushes by Savage (1897) and continued by Anderson (1907). DuMont (1933:128) stated that breeding records of Northern Waterthrush in Iowa "must be considered misidentifications of *Seiurus motacilla*." W. Savage (in Savage 1894a:37) found a nest with 2 waterthrush eggs and 6 of the Brown-headed Cowbird. The nest card record is of a nest found on 13 June 1980 in Webster County by A. J. Branham.

Kentucky Warbler, *Oporornis formosus* (Wilson). — F: 150, "several times"; NC: 0 of 0. Two specific Iowa records were from Jackson County (Giddings 1897) and from Lee County (DuMont 1936).

Common Yellowthroat, *Geothlypis trichas* (Linnaeus). — F: 300+, "frequently"; NC: 11 of 35. Specific mention of Iowa records include J. E. Law (in Savage 1894a), Savage (1897), Shaver (1918), Prescholdt (1958), Lowther (1983), and 1 museum record (WFVZ 105541).

Hooded Warbler, *Wilsonia citrina* (Boddaert). — F: 57, 2; NC: 0 of 0. One set of eggs (WFVZ 105551), taken 24 June 1894 in Lee County, added this species to Iowa's list of cowbird hosts (Currier 1894; see also DuMont 1936).

Yellow-breasted Chat, *Icteria virens* (Linnaeus). — F: 183, "frequently"; NC: 0 of 3. Chats are on Savage's (1897) host list and have been reported as cowbird hosts by Peasley and Peasley (1957) and Burk (1962).

Scarlet Tanager, *Piranga olivacea* (Gmelin). — F: 77, "several times"; NC: 0 of 0. Keyes and Williams (1888) declared that this species was "almost invariably" found parasitized and Savage (1894a:63) described tanagers as "grossly imposed upon" by cowbirds. J. E. Law (in Savage 1894a:36), Savage (1897) and Stephens (1938) reported on parasitized Scarlet Tanager nests. Keyes (1884) described a nest he found with a cowbird egg buried in the lining.

Northern Cardinal, *Cardinalis cardinalis* (Linnaeus). — F: 159, "several times"; NC: 13 of 73. Several references provide Iowa records of this species being a cowbird host (Polderboer 1939, Steffen 1945, Stoner 1919, Wendelburg 1941, Youngworth 1959). A single museum record exists (UNI 68.9.50.142e).

Rose-breasted Grosbeak, *Pheucticus ludovicianus* (Linnaeus). — F: 53, "several times"; NC: 5 of 39. Keyes and Williams (1888), J. E. Law (in Savage 1894a:36), and Savage (1897) included Rose-breasted Grosbeaks in their host lists. One museum record (WFVZ 90127) exists.

Blue Grosbeak, *Guiraca caerulea* (Linnaeus). — F: 66, 1; NC: 1 of 2. The nest card record is of a nest found by D. C. Harr in O'Brien County on 24 June 1982. Weaver (1949) found a parasitized nest in South Dakota near the Iowa border.

Indigo Bunting, *Passerina cyanea* (Linnaeus). — F: 200, "frequently"; NC: 3 of 5. J. E. Law (in Savage 1894a) and Savage (1897) included Indigo Buntings in their host lists; Burk (1939) recorded an instance of parasitism. The Western Foundation has 3 parasitized egg sets taken in Iowa (WFVZ uncat., WFVZ 93992, WFVZ 93993).

Dickcissel, *Spiza americana* (Gmelin). — F: 500+, 0; NC: 7 of 27. Anderson (1907, in Savage 1894a) included Dickcissels in his host lists. Carter (1957a) recorded a specific instance and Lowther (1983) reported 2 more, including a nest of a bird that buried 3 cowbird eggs. Bullock (1887) described a nest with 3 Dickcissel, 1 cowbird, and 1 Yellow-billed Cuckoo egg. One museum record (WFVZ 112129) was taken in Lee County on 11 June 1895 and contained 5 host and 1 cowbird egg. Zimmerman (1983) found Dickcissels commonly reared cowbird young during his long term Kansas study.

Rufous-sided Towhee, *Pipilo erythrophthalmus* (Linnaeus). — F: 328, "frequently"; NC: 0 of 13. Savage (1893) described towhees as "often" parasitized and mentioned a nest he found 17 May 1893 with 3 towhee and 5 cowbird eggs. Hawthorn (1902) described another full nest with 8 cowbird eggs and a two-thirds grown nestling cowbird. Towhees were listed as cowbird hosts by Anderson (1907), Keyes and Williams (1888), Polderboer (1939), Stoner (1919, 1949), and Savage (1894a).

Chipping Sparrow, *Spizella passerina* (Bechstein). — F: 877, "frequently"; NC: 2 of 21. C. C. Smith (in Crone 1895) felt this species was Iowa's most imposed upon cowbird host. J. E. Law (in Savage 1894a) and Savage (1897) listed Chipping Sparrows among the cowbird hosts they knew. Burk (1939) also found this sparrow serving as a cowbird host.

Field Sparrow, *Spizella pusilla* (Wilson). — F: 193, "several times"; NC: 9 of 47. Savage (1894a, 1897) included Field Sparrows among his cowbird hosts; Wilson (1897) mentioned contents of 1 parasitized nest. Crooks and Henderson (1953) found 16 of 20 Field Sparrow nests they studied were parasitized.

Vesper Sparrow, *Pooecetes gramineus* (Gmelin). — F: 130, "several times"; NC: 1 of 7. Savage (1897) listed this sparrow as an Iowa cowbird host. Kline (1961) found 2 of 3 nests parasitized and Rodenhouse and Best (1983) found 13 of 45 nests of Vesper Sparrows to have been parasitized.

Lark Sparrow, *Chondestes grammacus* (Say). — F: 70, 2; NC: 0 of 2. Savage (1894a:5) gave details of 1 parasitized nest. One museum record also exists (UNI 68.9.50.11388e).

Savannah Sparrow, *Passerculus sandwichensis* (Gmelin) — F: 84, 2; NC: 1 of 5. The nest card record was of a nest found by R. S. Bennett in Story County on 11 June 1979.

Grasshopper Sparrow, *Ammodramus savannarum* (Gmelin). — F: 28, 0; NC: 2 of 13. Lowther (1983) provides an additional Iowa record of cowbird parasitism. This species has been found to rear cowbird young (Elliott 1978).

Song Sparrow, *Melospiza melodia* (Wilson). — F: 1355+, "frequently"; NC: 0 of 12. Marceau (1891) noted one nest with 4 sparrow and 5 cowbird eggs. J. E. Law (in Savage 1894a) listed Song Sparrows as a host. Kline (1961) found 1 of 3 nests parasitized and Lowther (1983) found 2 family groups comprised of adult Song Sparrows and young Brown-headed Cowbirds.

Swamp Sparrow, *Melospiza georgiana* (Latham). — F: 70, "several times"; NC: 2 of 5. The 2 nest card records add this species to Iowa's host list. One nest in Cerro Gordo County, found by R. Hay on 28 July 1980, held cowbird eggs; another nest found by B. R. Ohde in Hancock County on 7 June 1982 also contained cowbird eggs.

Bobolink, *Dolichonyx oryzivorus* (Linnaeus). — F: 33, 2; NC: 0 of 15. J. V. Crone (in Savage 1894a) and Gabrielson (1914) listed

Bobolinks as a cowbird host. Lowther (1983) described 1 parasitized Bobolink nest (out of 3 found) in northwestern Iowa.

Red-winged Blackbird, *Agelaius phoeniceus* (Linnaeus). — F: 500+, 1; NC: 67 of 341. Redwings were listed as cowbird hosts by Anderson (in Savage 1894a, 1907) and Gabrielson (1914). Parsons (1945) found parasitized nests. Krapu (1978) found 3 of 127 marsh nests and 8 of 28 upland nests to have been parasitized. Lowther (1983) reported 32 of 98 redwing nests were parasitized in what could be characterized as upland prairie habitats; cowbirds were reared in 6 of these nests. There is 1 museum set from Iowa (USNM 35267).

Eastern Meadowlark, *Sturnella magna* (Linnaeus). — F: 87, yes; NC: 3 of 17. Savage (1897) included this meadowlark in his host list.

Western Meadowlark, *Sturnella neglecta* Audubon. — F: 24, 0; NC: 2 of 11. Gabrielson (1914) gave only vague reference of parasitism of this species.

Common Grackle, *Quiscalus quiscula* (Linnaeus). — F: 12, 0; NC: 1 of 46. Keyes and Williams (1888) listed grackles as a cowbird host but gave no details. The nest card record is of a nest found by D. W. Jackson on 10 May 1979 in Lucas County.

Orchard Oriole, *Icterus spurius* (Linnaeus). — F: 35, "several times"; NC: 0 of 4. J. V. Crone (in Savage 1894a:42) described Orchard Orioles as "impose[d]" upon. R. M. Anderson (in Savage 1894a:36) and Savage (1897) included this species in later host lists. Youngworth (1946) noted an instance of parasitism and G. Black reported an oriole nest parasitized by a cowbird when the host young was 2 days old (Brown 1972). Four parasitized museum sets exist from Iowa (WFVZ 115770, WFVZ 116524, UAM 57-7-119, USNM 44495).

Northern Oriole, *Icterus galbula* (Linnaeus). — F: 38, 3; NC: 0 of 20. Savage (1897) included this oriole in his host list. Northern Orioles usually eject cowbird eggs (Rothstein 1975).

Pine Siskin, *Carduelis pinus* (Wilson). — F: 14, 2; NC: 1 of 2. Dales and Bennett (1929) recorded an Iowa record of parasitism of Pine Siskins. The nest card record is of a siskin nest found by J. J. Dinsmore in Story County on 4 May 1982.

American Goldfinch, *Carduelis tristis* (Linnaeus). — F: 82+, "several times"; NC: 3 of 55. Crooks and Hendrickson (1953) mentioned 1 parasitized goldfinch nest was found during their sparrow study. The 3 nest card records describe nests first found on 28 June 1977 by M. P. Mann in Emmitt County, 24 July 1980 by R. Hay in Cerro Gordo County, and 28 July 1980 by J. White in Cerro Gordo County.

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## APPENDIX.

List of species recorded as cowbird hosts (Friedmann 1963, Friedmann et al. 1977) which breed in Iowa (Records Committee of I.O.U. 1982, Dinsmore et al. 1984) but have not been recorded as hosts in Iowa.

\*indicates species known to have reared cowbird young.

Blue-winged Teal, *Anas discors* Linnaeus, F: 1,0, NC: 216; Virginia Rail, *Rallus limicola* Vieillot, F: 1,0, NC: 7; Killdeer, *Charadrius vociferus* Linnaeus, F: 2,0, NC: 9; Spotted Sandpiper, *Actitis macularia* (Linnaeus), F: 5,0, NC: 0; Upland Sandpiper, *Bartramia longicauda* (Bechstein), F: 1,0, NC: 0; Wilson's Phalarope, *Phalaropus tricolor* (Vieillot), F: 3,0, NC: 0; Black-billed Cuckoo, *Coccyzus erythrophthalmus* (Wilson), F: 5,0, NC: 37; Yellow-billed Cuckoo, *Coccyzus americanus* (Linnaeus), F: 6,0, NC: 33; Ruby-throated Hummingbird, *Archilochus colubris* (Linnaeus), F: 1?,0, NC: 0; Red-headed Woodpecker, *Melanerpes erythrocephalus* (Linnaeus), F: 1+?,0, NC: 3; Say's Phoebe, *Sayornis saya* (Bonaparte), F: 6,0, NC: 1; Western Kingbird, *Tyrannus verticalis* Say, F: 4,0, NC: 0; \*Scissor-tailed Flycatcher, *Tyrannus forficatus* (Gmelin), F: 4,1, NC: 0; Purple Martin, *Progne subis* Linnaeus, F: 1?,0, NC: 3; \*Tree Swallow, *Tachycineta bicolor* (Vieillot), F: 1+ ,1, NC: 6; Bank Swallow, *Riparia riparia* (Linnaeus), F: 1,0, NC: 2; Cliff Swallow, *Hirundo pyrrhonota* Vieillot, F: 8,0, NC: 0; Blue Jay, *Cyanocitta cristata* (Linnaeus), F: 4,0, NC: 26; American Crow, *Corvus brachyrhynchos* Brehm, F: 3,0, NC: 2; Tufted Titmouse, *Parus bicolor* Linnaeus, F: 7,0, NC: 0; White-breasted Nuthatch, *Sitta carolinensis* Latham, F: 7,0, NC: 1; \*Brown Creeper, *Certhia americana* Bonaparte, F: 1,1, NC: 0; \*Carolina Wren, *Thryothorus ludovicianus* (Latham), F: 19,6, NC: 0; \*Bewick's Wren, *Thryomanes bewickii* (Audubon), F: 16,1, NC: 1; Northern Mockingbird, *Mimus polyglottos* (Linnaeus), F: 8,0, NC: 2; \*European Starling, *Sturnus vulgaris* Linnaeus, F: 3,1, NC: 1; \*White-eyed Vireo, *Vireo griseus* (Boddaert), F: 59, "frequently", NC: 0; \*Golden-winged Warbler, *Vermivora chrysoptera* (Linnaeus), F: 37, "several times", NC: 0; Northern Parula, *Parula americana* (Linnaeus), F: 12,0, NC: 0; Yellow-throated Warbler, *Dendroica dominica* (Linnaeus), F: 1,0, NC: 0; \*Prairie Warbler, *Dendroica discolor* (Vieillot), F: 35, "several times", NC: 0; \*Cerulean Warbler, *Dendroica cerulea* (Wilson), F: 12,1, NC: 0; \*Summer Tanager, *Piranga rubra* (Linnaeus), F: 19, "several times", NC: 0; \*Clay-colored Sparrow, *Spizella pallida* (Swainson), F: 50, "frequently", NC: 0; Yellow-headed Blackbird, *Xanthocephalus xanthocephalus* (Bonaparte), F: 16,0, NC: 32; House Sparrow, *Passer domesticus* (Linnaeus), F: 14,0, NC: 13.