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RESPONSE OF BROOD-PARASITIC BRONZED COWBIRD TO PLAYBACK OF THE SONG OF AUDUBON'S ORIOLE

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ABSTRACT—In the Lower Rio Grande Valley of South Texas, Audubon's orioles (*Icterus graduacauda*) have declined substantially in the past 50 y, probably due to habitat loss, fragmentation, and brood parasitism by bronzed cowbirds (*Molothrus aeneus*). Tape playback of the song of Audubon's oriole, originally intended to better survey the oriole, also attracted bronzed cowbirds. Bronzed cowbirds flew silently into the nearest tree in 14.1% of 234 playbacks, whereas Audubon's orioles responded vocally or flew toward the recorder in 15.8% of playbacks. Bronzed cowbirds might use vocalizations of Audubon's oriole as a cue to find breeding pairs or nests of this secretive species, which usually forages and sings within dense foliage.

RESUMEN—En el Bajo Valle del Río Grande del sur de Tejas, la población de chorcha de cabeza negra (*Icterus graduacauda*) se ha disminuido de una manera substancial en los últimos cincuenta años. Esto se debe probablemente a la pérdida de habitats, fragmentación, o quizás al empollamiento parasitario practicado por los pájaros vaqueros bronceados (*Molothrus aeneus*). Grabaciones emitidas del canto de la chorcha de cabeza negra, que inicialmente estaban destinadas a la inspección de estos pájaros, también llamaron la atención de los vaqueros bronceados. Los resultados indicaron que los vaqueros bronceados volaron silenciosamente al árbol más cercano en un 14.1% de las 234 emisiones de las grabaciones del canto de la chorcha de cabeza negra mientras que las chorchas de cabeza negra respondieron vocalmente o volaron hacia la fuente del sonido grabado en un 15.8% del total de las emisiones. Los pájaros vaqueros bronceados pueden usar sonidos de la chorcha de cabeza negra como una guía para encontrar pares de cría o nidos de esta especie de conducta reservada que se alimenta de forrajes y que canta en medio de densos follajes.

Audubon's oriole (*Icterus graduacauda*) is a declining permanent resident in the Lower Rio Grande Valley of southernmost Texas (Starr, Hidalgo, Cameron, and Willacy counties; Fig. 1)

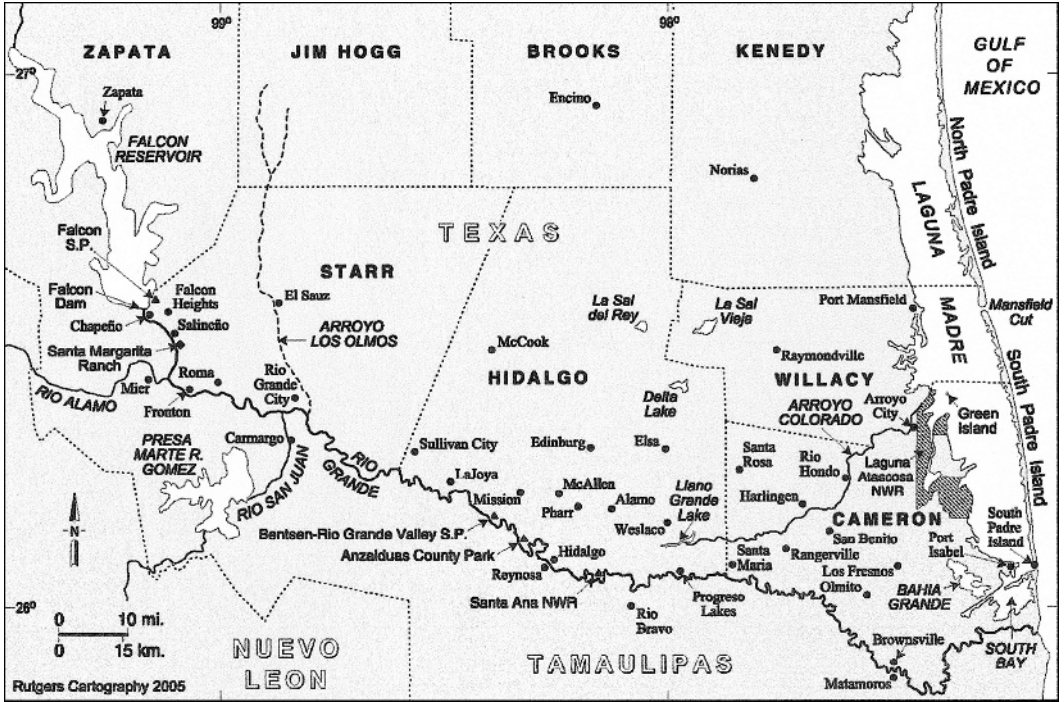


FIG. 1—Study sites where we played recordings of songs of Audubon’s oriole (*Icterus graduacauda*) along the Rio Grande between Falcon Dam, Starr County, and Anzaldúas County Park, Hidalgo County, Texas.

and is on the national Partners in Flight watch list (Rich et al., 2004). In the Lower Rio Grande Valley, >90% of native forest and scrub was cleared for agriculture during the 20th century (Tremblay et al., 2005), and remaining forest tracts are highly isolated, except in Starr County, where Audubon’s oriole remains more widespread (Monk, 2003).

Ornithologists visiting the Lower Rio Grande Valley in the late 1800s and early 1900s noted the extreme susceptibility of Audubon’s oriole to brood parasitism by the bronzed cowbird (*Molothrus aeneus*) and secondarily the brown-headed cowbird (*Molothrus ater*—Friedmann, 1929, 1963). During the 1980s, Audubon’s oriole disappeared from Santa Ana National Wildlife Refuge and other protected areas, despite apparently suitable habitat (Carter, 1986; Brush and Cantu, 1998; Brush, 2005). Populations of the bronzed cowbird have increased in South Texas, and brood parasitism by bronzed cowbirds might partially explain why Audubon’s oriole has declined in the Lower Rio Grande Valley (Brush, 2005).

Female cowbirds must be able to locate nests effectively to parasitize them. Female brown-headed cowbirds have shown the ability to discriminate between songs of a common host species and a more aggressive host species in a laboratory study (Hauber et al., 2002). In nature, female brown-headed cowbirds probably use vocalizations of hosts as one nest-finding cue (Uyehara and Narins, 1995; Clotfelter, 1998). Carter (1986) and Lowther (1995) suggested that female bronzed cowbirds cued on vocalizations and nest-defense behavior by potential hosts already responding to the presence of other females. In this study, we examined responses of bronzed cowbirds to tape playback of the song of Audubon’s oriole.

SGM did 10-minute point-count bird surveys (hereafter, point counts) in April and May 2001 and 2002 at 234 points in the southwestern Lower Rio Grande Valley (Fig. 1), as part of a study of habitat use and abundance of Audubon’s oriole (Monk, 2003). Points were located in areas of known occurrence (along the Rio Grande from Falcon Dam to Roma, Starr

TABLE 1—Responses of Audubon's orioles (*Icterus graduacauda*) and bronzed cowbirds (*Molothrus aeneus*) to playback of songs of Audubon's oriole within the current range of Audubon's oriole in the Lower Rio Grande Valley, Texas. The study area was between La Joya and Falcon Dam; the riparian habitat currently inhabited by Audubon's oriole. Song was played immediately after each of 3 point counts at 78 sites.

	Responded	Did not respond	Total
Bronzed cowbird			
Detected during point count	19	103	122
Not detected during point count	14	98	112
Total	33	201	234
Audubon's oriole			
Detected during point count	26	16	42
Not detected during point count	11	181	192
Total	37	197	234

County) and in areas suspected of containing territorial Audubon's orioles (downstream from Roma to Anzaldúas Dam, Hidalgo County, and along the Río San Juan and Río Alamo in Tamaulipas, Mexico, and the Arroyo Los Olmos in Starr County, Texas). Most points were in the riparian zone of the Rio Grande, while a few were in the transition zone between riparian forest and thorn scrub. Points were ≥ 200 m apart (for further details on site locations and methods see Monk, 2003).

Once in 2001 and twice in 2002 at each point, SGM played a recording of the Audubon's oriole song for 45 sec after the point-count. We recorded how many Audubon's orioles and bronzed cowbirds responded by flying toward the tape-player or vocalizing within the 3-minute period after playing the tape, regardless of whether they had already been detected during a particular survey period. Because of dense foliage in most parts of the study area, we were not able to determine the distance from which birds were responding. Poor lighting conditions and similarity of appearance prevented us from determining sex of responding cowbirds or orioles in most cases. We used χ^2 tests to analyze patterns of response (Sokal and Rohlf, 1973).

Overall, bronzed cowbirds were detected during 52.1% and Audubon's orioles were detected on 17.9% of the 234 point-count surveys, not including responses to song playback of Audubon's oriole. Bronzed cowbirds and Audubon's orioles both responded to playback of song of Audubon's oriole. Bronzed cowbirds responded by flying silently into a tree close to the observer. Overall, bronzed cowbirds responded on 14.1% of all 234 broadcast song

playbacks (Table 1). Rate of response of bronzed cowbirds was similar whether the species had or had not been recorded during the preceding point count; 15.6 and 12.5%, respectively ($\chi^2 = 0.76$, $df = 1$, $P < 0.500$).

Audubon's orioles responded to broadcast song by flying into a nearby tree or by vocalizing. Overall, Audubon's orioles responded on 15.8% of all playbacks, with a much higher response rate if the species had been recorded during the previous point count: 61.9 and 5.7%, respectively ($\chi^2 = 82.36$, $df = 1$, $P < 0.005$).

Although not surprising, bronzed cowbirds' response to tape playback of a host species, Audubon's oriole, has not been documented. Bronzed cowbirds may use vocalizations of Audubon's oriole as cues in locating nests, as brown-headed cowbirds apparently do (Uyehara and Narins, 1995; Clotfelter, 1998). Given the well-hidden nest location and secretive nature of Audubon's oriole (Flood, 1990; Flood et al., 2002), listening for the song may be particularly important for female bronzed cowbirds looking for nests of Audubon's oriole.

The heavy brood-parasitism noted in the Brownsville, Texas, area in the late 1800s and early 1900s (Friedmann, 1929) suggests that Audubon's oriole may be one of the preferred hosts of the bronzed cowbird. An interesting study would be to test whether bronzed cowbirds respond to songs of other hosts, such as the Altamira oriole (*Icterus gularis*), hooded oriole (*I. cucullatus*), green jay (*Cyanocorax yncas*), long-billed thrasher (*Toxostoma longirostre*), and olive sparrow (*Arremonops rufivirgatus*), which are parasitized to varying degrees in the Lower Rio Grande Valley (Brush, 2005). Further research

on responsiveness of bronzed cowbirds to songs or other vocalizations of hosts in different parts of the range of the species might shed more light on nest-finding techniques of this expanding brood parasite (Kostecke et al., 2004).

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