NOTES

OBSERVATIONS ON THE NESTING SUCCESS OF BELL'S VIREOS IN SOUTHERN ARIZONA

CLARENCE F. CLARK, 2625 E. Southern-C 214, Tempe, Arizona 85282

In its notice of Rulemaking Actions proposing the listing of both the Least Bell's Vireo (*Vireo bellii pusillus*) and the Arizona Bell's Vireo (*V. b. arizonae*) as endangered species, the U. S. Fish and Wildlife Service (1980) attributed the birds' decline in California both to loss of habitat and to parasitism by Brown-headed Cowbirds (*Molothrus ater*). As I recalled my casual observations of the Arizona Bell's Vireo from 1976 to 1978, they did not indicate heavy parasitism by cowbirds. I decided to keep records of my observations of Bell's Vireo nests during my biweekly trips along the upper Santa Cruz River, Arizona, to learn more about the species' status in the area (Table 1).

Of the 24 nests I located along the Santa Cruz River between Sahuarita and Tubac from 1979 through 1981, only seven contained cowbird eggs. However, 16 nests produced 40 young vireos which were completely feathered at the time of my last observation. Four other nests had contained eggs that for some unknown reason disappeared during my observations.

I removed the cowbird egg from two of the seven parasitized nests. The remaining three vireo eggs in one nest hatched after the removal of the cowbird egg, and the young were fledged at my last visit. Two days after I removed the cowbird egg from the second nest, I found the remaining vireo eggs punctured.

A third parasitized vireo nest contained a cowbird egg with two vireo eggs. On the second day after I found the nest, the cowbird egg was raised from the bottom of the nest to the rim, where it was lodged in the nest material. The cowbird egg later disappeared from the rim of the nest, the two vireo eggs hatched, and the vireos grew to fledglings.

A fourth nest contained two vireo eggs and a cowbird egg when I found it. Two days later, the cowbird egg was gone, but a third vireo egg was present. A brood of three vireos fledged from the nest.

I found two of the parasitized nests after the cowbird eggs had hatched, and no vireo eggs or nestlings remained. In the seventh nest, I observed the nestling cowbird deliberately or accidentally pushing a young vireo out of the nest. I later observed the fledgling cowbird leave the nest when it was disturbed.

Two nests of four vireo eggs hatched, but each contained a runt. I observed one runt being pushed out of one nest by the other vireos. The runt from the second nest was found lying dead on the ground below the nest.

In southern California, Wilbur (1979) reported observing parasitism of seven of 14 nests, of which three failed. Goldwasser et al. (1980) found the failure of 33% of Bell's vireo nests in one study to be due to cowbird parasitism. Serena (1986) stated that at least five of nine vireo nests found along the lower Colorado River had been parasitized by cowbirds. She wrote "from these data it seems fair to conclude that cowbirds are effectively reducing vireo nesting success, even in areas of low cowbird densities."

Hunter (1984) reported on his studies of nine species of birds occurring in the riparian habitat along the lower Colorado River, in southeastern California, and considered to be in danger of extirpation in the area. He found that "the same trends in population decline seen in Bell's Vireos and Yellow Warblers also are seen in Yellow-billed Cuckoos, Vermilion Flycatchers and Summer Tanagers. The latter three species are not heavily parasitized by

Table 1 Bell's Vireo Nesting Success in the Upper Santa Cruz River Valley, Arizona

	Bell's Vireo			Brown-headed Cowbird			
Date nest found	Eggs	Young hatched	Young fledged	Eggs	Young hatched	Young fledged	Notes
24 Apr 1979	4	3	3	0	0	0	
4 May 1979	4	4	0	0	0	0	
8 May 1979	3	3	0	0	0	0	
11 May 1979	0	0	0	1	1	0	No vireo eggs in the nest when found.
14 May 1979	3	3	2	0	0	0	
4 Jun 1979	3	2	0	1	0	0	I removed the cowbird egg. Two days later the vireo eggs were punctured.
21 Aug 1979	4	4	4	0	0	0	Young fledged when the nest was found.
14 May 1980	3	3	2	0	0	0	
16 May 1980	4	0	0	0	0	0	
20 May 1980	3	3	3	1	0	0	The cowbird egg disappeared before the third vireo egg was laid.
28 May 1980	3	3	3	0	0	0	
1 Jun 1980	3	3	2	1	0	0	

Date nest found	Bell's Vireo			Brown-headed Cowbird			Notes
	Eggs	Young hatched	Young fledged	Eggs	Young hatched	Young fledged	
5 Jun 1980	2	2	2	1	0	0	The cowbird egg was raised to the rim of the nest and later disappeared.
7 Jun 1980	3	3	3	1	0	0	I removed the cowbird egg and later watched the fledged vireos leave the nest.
9 Jun 1980	2	2	2	0	0	0	
13 Jun 1980	4	4	3	0	0	0	
30 Apr 1981	3	3	3	0	0	0	
14 May 1981	0	0	0	1	1	1	One cowbird egg but no vireo eggs were in the nest when it was found.
16 May 1981	4	3	2	0	0	0	
21 May 1981	4	0	0	0	0	0	
13 Jun 1981	4	4	3	0	0	0	A runt disappeared before fledging.
16 Jun 1981	4	3	1	0	0	0	
23 Jun 1981	4	3	2	0	0	0	

cowbirds." My casual observations from 1979 through 1981 suggest that the majority of the parasitized nests I found were in less dense foliage such as mesquite, and the most successful ones were in fence-row thickets and elderberry.

In my study, I found 24 nests containing 70 vireo eggs, of which 84% hatched and 59.9% fledged. Seven of the 24 nests were parasitized with cowbird eggs (30%), one egg per nest. Two (8%) of the parasitized nests produced one cowbird nestling each, of which only one fledged.

LITERATURE CITED

Goldwasser, S., Gaines, D., and Wilbur, S. R. 1980. The Least Vireo in California: A *de facto* endangered race. Am. Birds 34:742-745.

Hunter, W. C. 1984. Status of nine bird species of special concern along the Colorado River. Calif. Dept. Fish and Game, Nongame Wildlife Invest., Wildlife Branch Admin. Rept. 84-2:1—63.

Serena, M. 1986. Distribution, habitat preferences, and reproductive success of Arizona Bell's vireo (*Vireo bellii arizonae*) along the lower Colorado River. Calif. Dept. Fish and Game, Nongame Wildlife Invest., Project E W-5, Final Rept., Job IV-38-1:1-17.

U. S. Fish and Wildlife Service 1980. Rulemaking Actions. February 1980. U. S. Dept. Interior, Fish and Wildlife Serv. Endangered Species Tech. Bull. V (3):11.

Accepted 25 June 1988