

LITERATURE CITED

- BANGS, O., AND J. L. PETERS. 1927. Birds from the rain forest region of Veracruz. Bull. Mus. Comp. Zool. 67:471-487.
- CHERRIE, G. K. 1893. Exploraciones zoológicas efectuadas en laparte meridional de Costa Rica por los años de 1891-92. I. Aves. Anal. Inst. Geog. Mus. Nac. Costa Rica 4:133-148.
- LAND, H. 1970. Birds of Guatemala. Livingston Publ. Co., Wynnewood, Pa. 381 p.
- MONROE, B. L., JR. 1968. A distributional survey of the birds of Honduras. A.O.U. Monogr. no. 7. 458 p.
- PAYNTER, R. A., JR. 1960. no title, Family Troglodytidae. In E. Mayr and J. C. Greenway, Jr. Checklist of the birds of the world 9:379-440.
- RUSSELL, S. M. 1964. A distributional study of the birds of British Honduras. A.O.U. Monogr. no. 1. 195 p.
- SCLATER, P. L. "1856." Catalogue of the birds collected by M. Auguste Salle in southern México, with descriptions of new species. Proc. Zool. Soc. Lond. 24:283-311.
- TRAYLOR, M. A., JR. 1949. Notes on some Veracruz birds. Fieldiana 31:269-275.

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FOUR NEW MIGRANTS FOR COSTA RICA

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Sightings of four species of migrant passerines not previously recorded from Costa Rica (Slud 1964; Orians and Paulson 1969; Dickerman 1971) are reported here.

Vireo solitarius. Solitary Vireo. George V. N. Powell saw a bird of this species at Monteverde, Puntarenas Province, in the Cordillera de Tilarán in northwestern Costa Rica on 8 January 1971. The site was at 1540 m in Lower Montane Rain Forest (Holdridge 1967). The vireo attended a small mixed flock containing Golden-crowned Warblers (*Basileuterus culicivorus*) and Common Bush-Tanagers (*Chlorospingus ophthalmicus*). I saw a lone bird, perhaps the same individual, at the same location on 15 March 1971. The bird had a gray helmet, white lores and eye-ring (= spectacles), white throat, olive back, yellow wash on the flanks, and a heavy *Vireo* bill. This species has not previously been reported south of Nicaragua (Eisenmann 1955), where it is rarely encountered (T. R. Howell, pers. comm.).

Dendroica occidentalis. Hermit Warbler. Peter Feinsinger and I observed a single individual foraging low in a planted row of Guatemalan cypress (*Cupressus Benthami* Endl.) along a wood's edge in Monteverde on 20 October 1971, elevation 1450 m. The bird fed alone though several other migrants, including Townsend's Warblers (*Dendroica townsendi*) and Black-throated Green Warblers (*Dendroica virens*), were nearby. The bird was in immature or female plumage and was identified by its gray crown, nape, and back; yellow cheeks with hint of dark auriculars; unmarked white throat, chin, and underparts. Numerous other North American migrants were present on this date.

Dendroica townsendi. Townsend's Warbler. I saw this species frequently at Monteverde between 20 October and 5 April. Largest numbers (as many as six seen on 20 October 1971) and most frequent sightings occurred during the fall though a few birds were seen throughout the winter months. F. G. Stiles (pers. comm.) first observed the species at Monteverde on 16 September 1968. This is the earliest Costa Rican fall record. The bird was an "adult male" foraging in second growth. Edmund Stiles found a bird there on 28 January 1970. The species was

present at Monteverde during four consecutive winter seasons: 1968-69, 1969-70, 1970-71, and 1971-72. The range in elevation of my sightings was from 1390 to 1540 m along the transition between Lower Montane Wet and Lower Montane Rain Forest zones in the vicinity of Monteverde. With the exception of two or three birds in isolated broad-leaf pasture trees, all individuals were found in edge situations, in or close by Guatemalan cypress plantings. Most Monteverde sightings were of fall-plumaged birds in which extensive yellow on the underparts and dark auriculars were used as primary field marks for their identification. A few spring birds were in plumages intermediate between those of winter and summer. Most Townsend's Warblers occurred in loose associations with other wintering migrants, usually with Black-throated Green and Wilson's (*Wilsonia pusilla*) Warblers.

Elsewhere in Costa Rica, James Richardson (pers. comm.) observed a single singing male in "brilliant nuptial plumage . . . well up on the slope" of Volcán Irazú, Cartago Province, on 30 March 1969. The bird was feeding in a small clump of evergreen oaks in a cow pasture. I saw a single winter-plumaged bird working pasture trees at a site 1 km N of Rancho Redondo, San José Province, elevation 1950 m on 8 January 1972. These are the only records from the central plateau of the country. The southernmost and highest sighting of the species in Costa Rica was of a male observed by F. G. Stiles at 3150 m on Cerro Chirripó, Limón Province, on 4 March 1972. Stiles (pers. comm.) found "very large concentrations of migratory warblers at high elevations" on that date.

Dolichonyx oryzivorus. Bobolink. I found a single fall-plumaged Bobolink at the mouth of the Rio Nosara, approximately 4 km W of Nosara, Guanacaste Province, on 7 October 1971. The bird perched atop a hedge of *Bromelia Pinguin* L. on a grassy beach ridge and gave the characteristic pink call note of the species as it flew off. It was in a flock of about 30 seedeaters (*Sporophila* sp.).

Slud (1964), in his discussion of this species in Costa Rica, stated: "It would not be at all unreasonable to expect an occasional individual, especially along the Caribbean slope, but there is no evidence that the species has ever been seen or taken in Costa Rica." The present record is from the Pacific coast. The presence of a tropical storm in the Caribbean at the time of this observation may be significant.

Both warblers are known to winter rather commonly in the highland pine forest of northern Central America as far south as Nicaragua (Monroe 1968; T. R. Howell, pers. comm.). No conifers are native

to Costa Rica though extensive forests reach their southern limit in Nicaragua. The clearing, and with it the planting of Guatemalan Cypress in the cool highlands of Costa Rica during the last 50–70 years, may account for the appearance of these warblers. Cypress plantings have been present on the versants of the volcanic Cordillera Central above San José for a much longer period than in the northwestern divide, where few plantings exceed 20 years of age. These small stands in the northwest may be acting as stepping-stones for the extension of winter ranges of the warblers. Isolated stands of cypress are now found south and east along the Cordillera Talamanca of Costa Rica and on into the highlands of western Panamá. These provide potential habitats for future range extension. I cannot assess the relative abundance of Townsend's Warblers at Monteverde and elsewhere in Costa Rica, but the occurrence of "waves" of birds in the fall at Monteverde suggests substantial movement to more southern regions.

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LITERATURE CITED

- DICKERMAN, R. W. 1971. Further notes on Costa Rican birds. *Condor* 73:252–253.
 EISENMANN, E. 1955. The species of Middle American birds. *Trans. Linnaean Soc.* New York, 7.
 HOLDRIDGE, L. R. 1967. Life zone ecology. Tropical Science Center. San José, Costa Rica. 206 p.
 MONROE, B. L., JR. 1968. A distributional survey of the birds of Honduras. *Ornithol. Monogr.* no. 7, p. 330–331.
 ORIANS, G. H., AND D. R. PAULSON. 1969. Notes on Costa Rican birds. *Condor* 71:426–431.
 SLUD, P. 1964. The birds of Costa Rica. Distribution and ecology. *Bull. Amer. Mus. Nat. Hist.* 128: 1–430.

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DESCRIPTION OF AN AERIAL-PREDATOR ALARM CALL FOR MALLARD (*ANAS PLATYRHYNCHOS*) DUCKLINGS

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Although aerial alarm or "hawk warning" calls have been frequently described for gallinaceous birds (Collias and Joos 1953; Hale et al. 1969; Schleidt 1961; Williams 1969), there are few such references for waterfowl. Numerous authors have studied the response of waterfowl to overhead objects such as models of various raptors (McNiven 1960; Melzack 1961; Melzack et al. 1959; Tinbergen 1948), but these studies do not contain descriptions of an aerial alarm call.

Driver (1960) heard Common Eider (*Somateria mollissima*) ducklings give a "thin ascending note" in response to strangers on the horizon or unfamiliar overhead objects. Fabricius (1951) noted that young Tufted Ducks (*Aythya fuligula*) had a "note of terror" which was released when they saw flying gulls, and Weidmann (1956) reported that a one-week-old Mallard (*Anas platyrhynchos*) duckling

crouched and gave a call described as "piii" when an airplane passed overhead. Weidmann was also able to elicit this call with models. These authors did not include sonagrams of the calls.

Purely by chance, we were able to hear such an alarm or fear call when, like Weidmann, we observed an airplane passing over a small group of 2-week-old Mallards that we were raising on our lawn. One of the ducklings noticed the airplane and gave a shrill whistle. The group immediately crouched and became immobile. The call appeared to convey rather specific information concerning the presence of an overhead object. Whether or not this response was learned we do not know, because the call may have been a fear call that the ducklings had learned to associate with aerial danger during their first 2 weeks of life.

While spending the summer at the Delta Waterfowl Research Station, Delta, Manitoba, Canada, we constructed several models in an attempt to obtain a tape recording of the call. The models resembled the silhouette of a hawk and had wing spans of 10–18 inches. They were suspended from the tip of a long fishing rod and presented to ducklings of various ages.

Neither strong escape responses nor aerial alarm calls were observed when models were presented to ducklings less than one week old. This may reflect a lack of fear in young ducklings. Ramsay and Hess (1971) found that Mallard ducklings' response to a conditioned escape or alarm call increased with age during the first few days after hatching.

The best tape recording of the call was obtained by sailing a paper airplane, from the cover of a blind, over a brood of 2-week-old Mallards in a small pen. (We are grateful to F. Dale Caswell for obtaining this recording.) The recording was made on a Uher 4000 Report-L tape recorder at a speed of 7.5 inches/sec. The sonagram of this call (fig. 1) may be compared to those of "pleasure notes" (fig. 2) and "distress

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