

standing, specimen evidence of the occurrence of *S. sasin* is lacking for Texas (Oberholser 1974) and New Mexico (Hubbard 1978)—states that this species would likely traverse in reaching Louisiana. The numerous sightings from Texas require substantiation. Similarly, the many reports of *S. rufus* in the eastern United States (Conway and Drennan 1979) need individual re-evaluation. Because of the great similarity between the two *Selasphorus* species discussed here, because green-backed *S. rufus* males are known, because of possible hybridity, and because *S. rufus* occurs regularly in Louisiana in winter (Lowery 1974), sight records of *S. sasin* always may be unacceptable in Louisiana or anywhere east of Arizona. Nevertheless, the occurrence of Allen's Hummingbird in Louisiana is indisputable.

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LITERATURE CITED

- BANKS, R. C., AND N. K. JOHNSON. 1961. A review of North American hybrid hummingbirds. *Condor* 63: 3-28.
- BEAVERS, R. A. 1977. First specimen of Allen's Hummingbird, *Selasphorus sasin* [sic] (Trochilidae), from Texas. *Southwest. Nat.* 22:285.
- CONWAY, A. E., AND S. R. DRENNAN. 1979. Rufous Hummingbirds in eastern North America. *Am. Birds* 33:130-132.
- HAMILTON, R. 1976. Winter season. Central southern region. *Am. Birds* 30:730.
- HAMILTON, R. 1979. Winter season. Central southern region. *Am. Birds* 33:289.
- HAMILTON, R. 1980. Winter season. Central southern region. *Am. Birds* 34:281.
- HUBBARD, J. P. 1978. Revised check-list of the birds of New Mexico. New Mexico Ornithological Society Publication no. 6.
- IMHOF, T. 1978. The spring migration. Central southern region. *Am. Birds* 32:1020.
- LOWERY, G. H., JR. 1974. Louisiana birds. Louisiana State Univ. Press, Baton Rouge.
- LYNCH, J. F., AND P. L. AMES. 1970. A new hybrid hummingbird, *Archilochus alexandri* × *Selasphorus sasin*. *Condor* 72:209-212.
- OBERHOLSER, H. C. 1974. Bird life of Texas. Univ. of Texas Press, Austin.
- ORTIZ-CRESPO, F. I. 1972. A new method to separate immature and adult hummingbirds. *Auk* 89:851-857.
- PHILLIPS, A. R. 1975. The migration of Allen's and other hummingbirds. *Condor* 77:196-205.
- SHORT, L. L., JR., AND A. R. PHILLIPS. 1966. More hybrid hummingbirds from the United States. *Auk* 83:253-265.
- STILES, F. G. 1972. Age and sex determination in Rufous and Allen hummingbirds. *Condor* 74:25-32.
- WEBSTER, F. S., JR. 1978. Winter season. South Texas region. *Am. Birds* 32:374.
- WELLS, S., AND L. F. BAPTISTA. 1979. Displays and morphology of an Anna × Allen hummingbird hybrid. *Wilson Bull.* 91:524-532.

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IDENTIFICATION AND OCCURRENCE OF BLACKPOLL WARBLERS IN SOUTHERN MIDDLE AMERICA

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The Blackpoll Warbler (*Dendroica striata*) normally migrates southward in fall via a nonstop flight from the east coast of North America to northern South America (Nisbet 1970), with many individuals also passing through the West Indies (e.g., Bond 1971). The main wintering ground of the species is the upper Amazon and Orinoco watersheds in north-central South America (Keast 1980). Until recently, it was known in Middle America only from old specimen records from Tehuantepec and central Panama (Eisenmann 1955). In recent years, Blackpoll Warblers have been reported from both Panama and Costa Rica on the basis of sight records and birds banded and released (Ridgely 1976, Stiles and Smith 1980). Since the basic plumages of this species and its close relative, the Bay-breasted Warbler (*D. castanea*) are often very similar, specimen confirmation is highly desirable. Here we report the first specimens and additional sightings for Costa Rica, and summarize the available information on the occurrence of Blackpoll Warblers in southern Middle America.

Field identification of the two species in fall can be tricky: none of the definite and obvious average differences holds for all individuals. In general, Blackpoll Warblers are greenish-white to pale yellowish below, with dusky-olive streaking extending laterally from breast to flanks; Bay-breasted Warblers are more buffy-white below, with fainter streaking restricted to the flanks. However, some Blackpolls (especially young females) have very little streaking below, and a definite buffy-yellow tinge to the crissum. Conversely, some Bay-breasteds, notably adult females, have rather prominent streaking and little buffy tinge below, the crissum being pale buffy-white to nearly pure white. In *D. striata* the tarsi and anterior scutes of the feet are often brownish to dusky; these birds do not appear noticeably pale-legged in the field. However, examination of museum specimens has yielded a useful character for distinguishing these species in the hand. In *D. striata*, the outer webs of primaries 7 and 8 are emarginate near the tip; in *D. castanea* primaries 6, 7, and 8 are emarginate. Emargination averages less in immatures than adults, but all *D. castanea* seen have had the sixth primary at least "slightly cut out" (cf. Phillips et al. 1966); no sign of emargination of this primary has been seen in *D. striata*.

We mist-netted two Blackpoll Warblers during banding operations in an area of scrub and overgrown pasture ½ km northeast of the campus of the Universidad de Costa Rica (elev. 1,230 m). Provincia San José. The specimens are in the Museo de Zoología, Universidad de Costa Rica. Data are as follows: UCR 2370, adult female, 9 Nov 1980, light fat, skull ossified, ovary very small, 12.3 g; and UCR 2542, adult male, 30 Oct 1981, light fat, skull ossified, left

testis 1 mm, 12.0 g. Both birds were in fresh basic plumage; neither showed any emargination of primary 6; in both, the leg color was listed as dusky brownish, the soles and base of the posterior tarsus were yellowish.

We also observed one Blackpoll Warbler closely on 22 Nov 1980 near Bijagua, Prov. Alajuela, on the lower Caribbean slope of the Cordillera de Guanacaste. The bird was accompanying a mixed-species flock of greenlets, flycatchers, gnatcatchers, tanagers, and other migrant warblers (Tennessee, *Vermivora peregrina*; Chestnut-sided, *D. pensylvanica*) along the edge of dense second-growth adjoining primary forest at ca. 500 m elevation. Also, Stiles saw a Blackpoll Warbler at Puerto Vargas, on the Caribbean coast, on 7 Nov 1978. This bird was foraging alone in scrubby second-growth during the rainy, windy conditions of a Caribbean storm.

There are now at least ten records of Blackpoll Warblers in southern Middle America, assuming that all reported sightings and bandings are valid; the species is best considered a casual migrant and winter resident in this region. It appears to arrive late in the fall, the earliest record being a banded bird from Bocas del Toro on 19 October 1964 (Ridgely 1976); at least some individuals remain through January or later (Stiles and Smith 1980). The lack of records north of Costa Rica suggests that the birds straggle in directly from the Caribbean, rather than migrating down the coast with other transient warblers. The appearance of Blackpoll Warblers in southern Middle America is at most slightly later than their main passage through the West Indies (cf. Chapman 1917, Barbour 1943, Bond 1971). None of the birds seen or netted in Costa Rica seemed to be associating with *D. castanea*, which normally arrives in early-to-mid October, becomes extremely abundant by late October, and is uncommon at best from mid-November on through the winter (Stiles, unpubl. data). We mist-netted flocks of Bay-breasted Warblers in the week or two preceding the capture of each of our Blackpolls, but not on the day of capture in either case. The pattern of Blackpoll reports in Costa Rica (sea level to middle elevations on both slopes) suggests that birds straggle in individually and wander about, perhaps settling for the winter. A similar pattern seems to hold for several other warblers that normally migrate to or through the West Indies and are rare to accidental on both slopes of Costa Rica in winter.

These include the Palm (*D. palmarum*), Prairie (*D. discolor*), Cape May (*D. tigrina*), Pine (*D. pinus*), and Black-throated Blue (*D. caerulescens*) warblers (cf. Stiles and Smith 1980).

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LITERATURE CITED

- BARBOUR, T. 1943. Cuban ornithology. Mem. Nuttall Ornithological Club, no. 9.
- BOND, J. 1971. Birds of the West Indies. 2d ed. Houghton Mifflin Co., Boston.
- CHAPMAN, F. M. 1917. The warblers of North America. Dover reprint (1968), Dover Publications, New York.
- EISENMANN, E. 1955. The species of Middle American birds. Trans. Linn. Soc. NY. 7.
- KEAST, A. 1980. Spatial relationships of migratory parulid warblers and their ecological counterparts in the neotropics, p. 109–130. In A. Keast and E. S. Morton [eds.], Migrant birds in the neotropics: ecology, behavior, distribution, and conservation. Smithsonian Institution Press, Washington, DC.
- NISBET, I. C. T. 1970. Autumn migration of the Blackpoll Warbler: evidence for long flight provided by regional survey. Bird-Banding 41:207–240.
- PHILLIPS, A. R., M. A. HOWE, AND W. E. LANYON. 1966. Identification of the flycatchers of eastern North America, with special emphasis on the genus *Empidonax*. Bird-Banding 37:153–171.
- RIDGELY, R. S. 1976. A guide to the birds of Panama. Princeton Univ. Press, Princeton, NJ.
- STILES, F. G., AND S. M. SMITH. 1980. Notes on bird distribution in Costa Rica. Brenesia 17:137–156.

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PREDATION ON STEAMER-DUCKS BY KILLER WHALE

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Aquatic predators from four zoological classes—Cephalopoda, Chondrichthyes, Osteichthyes, and Mammalia—have been observed to prey at least occasionally on marine birds. Hindwood (1964) reported attacks by octopuses (*Octopus* spp.) on several larids and a penguin. Several species of shark, notably the tiger shark (*Galeocerdo cuvier*), are known to have eaten a variety of marine birds (Glegg 1945, Harrison 1955, Brooke and Wallet 1976). Legendre (1941) listed the blue shark (*Charcarias glaucus*)

as a predator of seabirds. Other marine piscine predators of birds include cod (*Gadus* spp.; Cobb 1927, Scheffer 1942, Glegg 1945, Harrison 1955), monkfish (*S. squatina*; Glegg 1945, Davenport 1979), eels (*A. anguilla*; Glegg 1945), and angler-fish (*Lophius piscatorius*; Legendre 1926, Leach 1943, Glegg 1945). Lowe (1943) and French (1981) observed attacks on birds by unidentified marine fishes.

Several pinnipeds are known predators of marine birds. Grey (*Haliochoerus grypus*; Grant and Bourne 1971, Kinneer 1977), harp (*Phoca groenlandica*; Glegg 1945), New Zealand fur (*Arctocephalus forsteri*; Stonehouse 1967), and leopard seals (*Hydrurga leptonyx*; Hamilton 1946, Glegg 1947) have been observed to kill or contain seabirds. Southern sea lions (*Otaria byronia*) are efficient predators of several South American marine birds, including steamer-ducks (*Tachyeres* spp.; Hamilton 1946, Glegg 1947, Boswall 1972).

We know of no published record of predation on birds by cetaceans, except Hamilton's (1946) report of a presumably accidental ingestion of a Cape Petrel (*Daption capense*) by a blue whale (*Balaenoptera musculus*). Killer