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TAXONOMIC REVISION OF THE GREATER ANTILLEAN PEWEE

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ABSTRACT.—The Greater Antillean Pewee (*Contopus caribaeus*) has mutually exclusive dawn songs in Hispaniola, Jamaica, Cuba, and the Bahamas. In Hispaniola, dawn songs are fast, emphatic, and loud, with one single and three paired syllables rising in pitch from ca 1.9–3.0 kHz. In Jamaica, dawn songs are weaker, having two and three syllable phrases, usually given alternately, and ranging from ca 2–4 kHz. In Cuba and the Bahamas, dawn songs are high-pitched, squeaky whistles, ascending and descending, and ranging from ca 3.0–5.5 kHz. These differences readily are discerned by ear and in sonograms. None of the vocalizations in the Bahama-Cuba region, Jamaica, or Hispaniola was duplicated in either of the other two populations. Most plumage differences among these populations are subtle, but birds in Cuba and the Bahamas have a striking, white, crescent-shaped "post-ocular spot" not found on pewees in Jamaica or Hispaniola. Pewees in Jamaica have smaller masses, and shorter tails, tarsi, wings, and exposed culmen than birds in Cuba. Dawn songs and measurements indicate that these populations of the Greater Antillean Pewee are sufficiently different to be recognized as separate species. *Received 25 Sept. 1991, accepted 20 Oct. 1992.*

The distribution of the Greater Antillean Pewee (*Contopus caribaeus*), (Peters 1979, AOU 1983, Bond 1985) includes the Bahama Islands of Abaco, Andros, New Providence, Eleuthera, and Cat Islands, Cuba (in-

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Photographs of pewees: (a) Cuba, Bermejos, Matanzas Province, (b) Cuba, Guajaba Key, north of Camaguey, (c) Bahamas, 'Rose 2', Great Abaco, (d) Bahamas, Hole in Wall, Great Abaco, (e) Hispaniola, Parque del Este, Dominican Republic, (f) Hispaniola, Santiago Rodriguez Province, Dominican Republic, (g) Jamaica, Sherwood Content, Trelawny Parish, (h) Jamaica, Crown Lands, Trelawny Parish.

TABLE 1

MASS AND WING MEASUREMENTS OF PEWEES

Locality	Mass (g)	Wing length (mm)
Cuba	11.6 ± 1.0 (29) a	72.2 ± 2.6 (62) a
Hispaniola	11.5 — (18) *	70.9 ± 1.9 (27) b
Bahamas	10.5 — (14) *	68.6 ± 1.8 (17) c
Jamaica	9.8 ± 0.6 (16) b	68.2 ± 2.3 (17) c

Values are means ± SD (N). Values not followed by the same letter differ significantly (* = SD not available and no statistical comparison was made).

cluding keys and Isle of Youth), Jamaica, Hispaniola, and one of its satellite islands, Gonave. We here present evidence of variations in song and plumage that indicate the possible presence of three species, instead of one.

METHODS

Tape recordings were made in the field throughout the day to obtain naturally occurring songs and calls, particularly dawn songs. Our tape file includes recordings from 18 individuals in Hispaniola, 25 in Cuba, 17 in Jamaica and five in the Bahamas. No playback experiments were run.

Tape recordings were made using Nagra IIIB, Uher 1000, Uher 4000 reel-to-reel recorders, and a Sony TCM 5000 cassette recorder. Microphones were models by Sony, AKG, and Sennheiser, with parabolic reflectors having diameters of 43 cm, 61 cm, or 91 cm. Sonograms were made with Kay Elemetrics 6061 units, in some cases first filtering the sounds through a Kron-Hite high and low pass filter. Copies of the recordings are deposited in the Library of Natural Sounds, Cornell Laboratory of Ornithology, Ithaca, New York. Three dawn song recordings are also found in two published phonograph record albums (Reynard 1981, entry #86; Reynard and Garrido 1988, entries #84 and A4). A copy of the color photo is deposited in the VIREO collection at the Academy of Natural Sciences of Philadelphia.

Plumages were evaluated from photos of living birds and from 171 specimens. Mensural information (wing, tarsus, tail, bill) from 150 of the specimens was taken, mainly by the second author. Data on mass were augmented by including values from Steadman et al. (1980), Olson (1985), and Buden and Olson (1989). The measurements were from specimens

TABLE 2

TARSUS, TAIL, AND BILL LENGTHS OF PEWEES[a]

Locality	Tarsus	Tail	Bill[b]
Cuba	16.4 ± 1.4 (29) a	67.2 ± 3.3 (62) a	15.0 ± 1.4 (60) a
Hispaniola	15.1 — (18) *	65.7 ± 4.6 (27) a	13.8 ± 1.0 (11) b
Bahamas	15.9 — (14) *	61.0 ± 2.4 (17) b	13.7 — (4) *
Jamaica	14.3 ± 0.8 (16) b	64.1 ± 2.2 (17) c	12.5 ± 1.5 (4) b

[a] All values are as given in Table 1; all measurements are in mm.
[b] Length of exposed culmen.

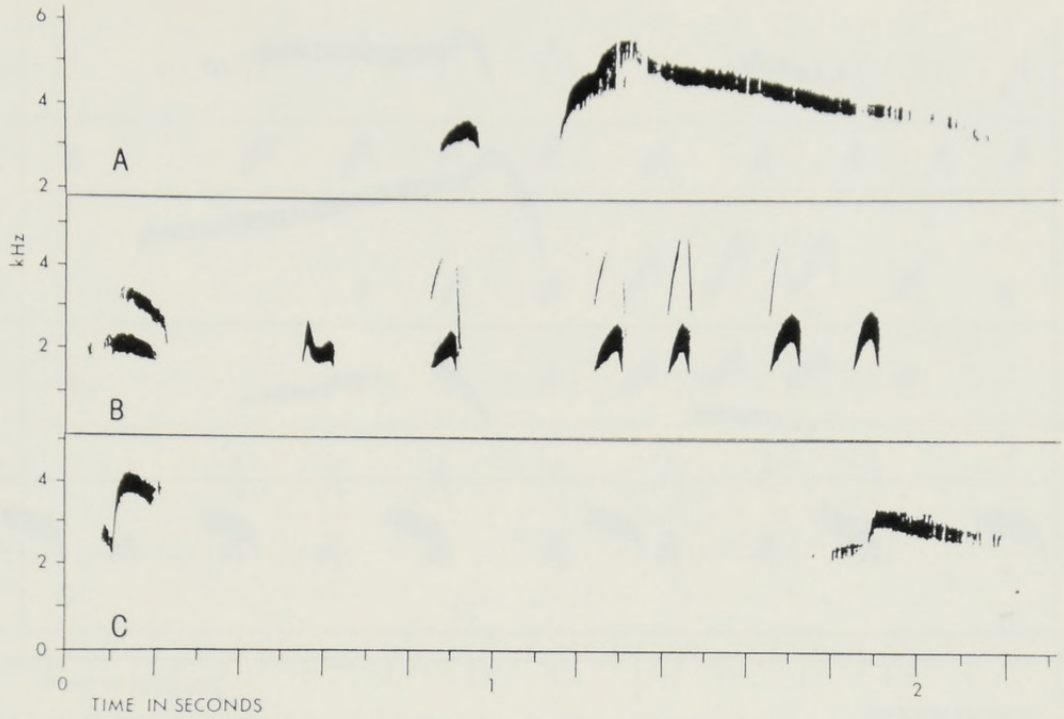

FIG. 1. Sonograms of species-specific dawn songs of resident pewees in Cuba (A), Hispaniola (B) and Jamaica (C).

on loan, received in Cuba, and from specimens examined during visits to collections in several Caribbean and North American museums. These included, among others visited, and listed in "Acknowledgments," The Smithsonian Institution, American Museum of Natural History, and the Royal Ontario Museum.

Data from male and female specimens were combined; we found that their mean values did not differ significantly using the "*z*" test at the 5% level (Natrella 1963). This same test was applied to population means in Tables 1 and 2.

RESULTS

Vocalizations.—Representative dawn song sonograms (Fig. 1) are shown for pewees in Cuba (A), Hispaniola (B), and Jamaica (C). The first is paraphrased "éeah owéeeah." In some performances, only the second phrase is used in some segments of the dawn song. Birds in Hispaniola sing a fast, emphatic song, "shurr, pet-pet, pit-pit, peet-peet," with the paired syllables successively rising in pitch. In Jamaica, the dawn song consists of two phrases, "paléet" and "weeléeah," usually given in alternate order, but sometimes one of the phrases is given twice in succession. The range in pitch also varies among these populations, covering ca 1.9–3.0 kHz in Hispaniola, 2–4 kHz in Jamaica, and 3–5 kHz in Cuba.

These varied song patterns are more than would be expected within the song repertoire of one *Contopus* species. The three songs sound strikingly different in the field—a high-pitched, weak, squeaky whistle in Cuban birds, a very loud, rapid-fire volley of short notes in Hispaniola and a smooth flowing, almost flute-like sound in Jamaica.

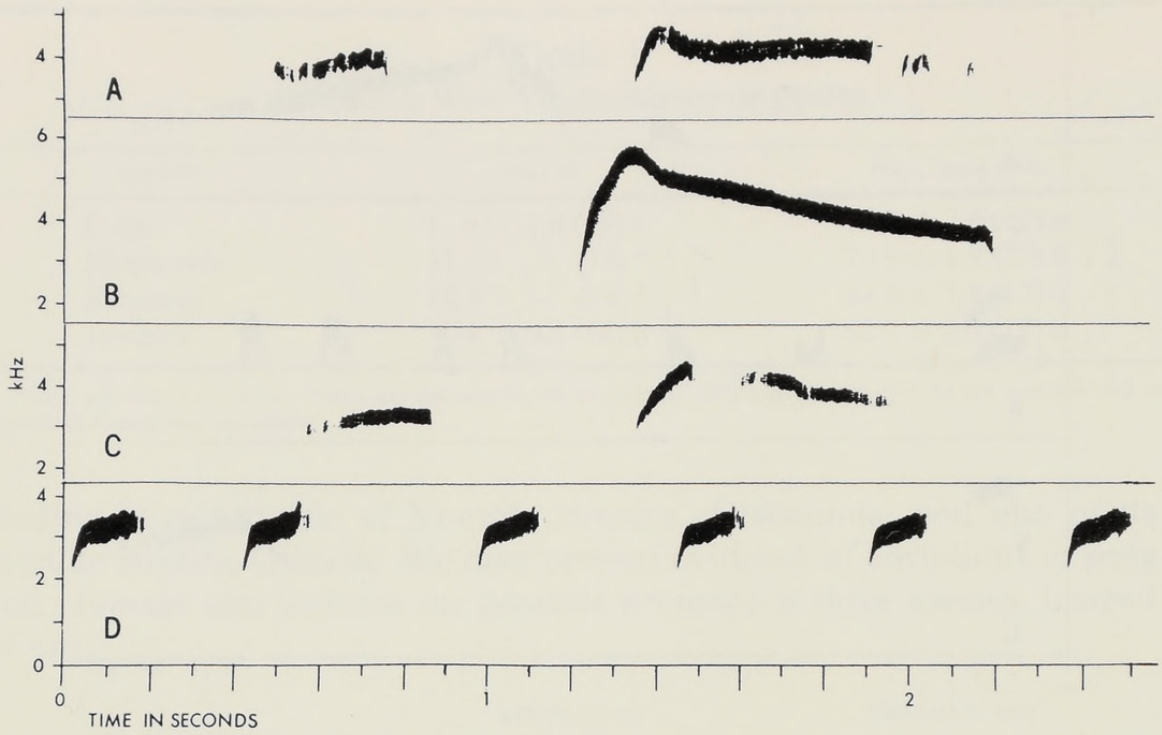

FIG. 2. Sonograms of pewee vocalizations, including dawn song on New Providence, Bahamas (A), 2nd phrase of dawn song in Cuba (B), a broken "slur" variation (C), and the disturbance calls of an adult near its nest in Cuba (D).

A significant feature of these performances is the comparatively rapid rate of delivery of the dawn songs, contrasting with more leisurely calls or phrases at other times of the day. This difference holds for other species of *Contopus* and has been documented, for example, by Craig (1943) for the Eastern Wood-Pewee (*C. virens*). Birds in Cuba repeat the dawn song every 3–4 sec, those in Hispaniola every 3–5 sec, and in Jamaica, every 2–3 sec. In contrast, daytime phrases are heard in Cuba at 6–8 sec intervals, and at 5–10 sec intervals in Jamaica. We did not hear or record any Pewees in Hispaniola using the "paired-syllable" pattern of the dawn song at any time during the rest of the day. We did not record any leisurely singing from this population.

The dawn song in the Bahamas is similar in pitch to the song in Cuba and has the same "squeaky whistle" quality. It differs from the song in Cuba (Figs. 1A, 2B) by the addition of two or more "dee dee" phrases after the "oweeah" phrase (Fig. 2A). We have not heard these additional phrases from birds in Cuba. Brudenelle-Bruce (1975) described the song in the Bahamas as a "clear ringing 'peeee, dee-dee-dee-dee-dee', with the 'dees' on a descending scale." The Bahama song (Fig. 2A) actually had three "dees"; the third, weaker, did not show on the sonogram.

There are some minor variations of the song phrases in Cuba. The "owéeah" phrase (Fig. 2B) has a more abrupt rise in pitch or a more or

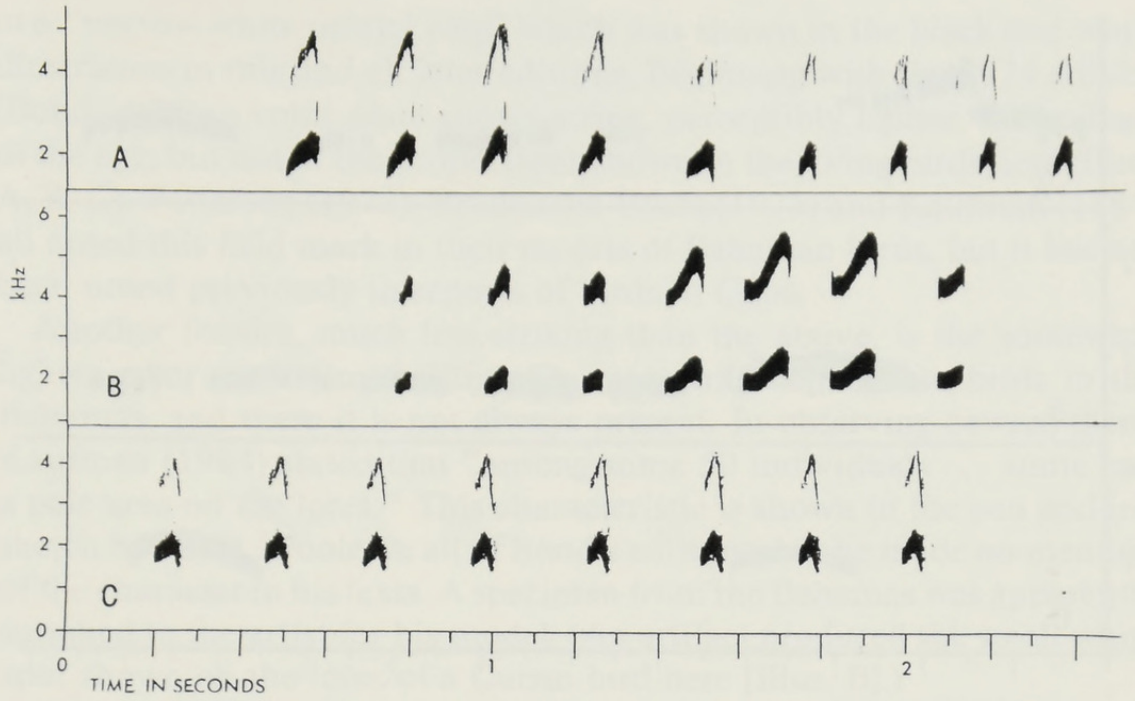

FIG. 3. Sonograms of pewee vocalizations in Hispaniola, demonstrating calls with a drop in pitch (A), those rising in pitch and intensity (B), and with uniform pitch (C).

less "broken" or interrupted slur (Fig. 2C), although the latter is barely discernible by ear. An additional vocalization is a series of "weet-weet" alarm calls (Fig. 2D). These were from an agitated bird when we came close to its nest near Santo Tomas, 28 April, 1978.

Additional calls from Hispaniola (Fig. 3) were usually heard when two or more individuals were present. They varied in pitch or intensity (Fig. 3A, B) or were more nearly uniform in each factor (Fig. 3C). These types of sounds were described by Dod (1978, 1981) as "prt" or "pit" and the song as "a sad, i-i-i-i-i." Wetmore and Swales (1931) used a colorful description of the Hispaniolan pewee song "a mournful call of considerable carrying power coming from the tops of pine trees, a note of several syllables that might be written pur pip pip pip pip;" this is similar to the sonogram here (Fig. 1B).

In Jamaica, the most frequent vocalization heard throughout the day is not a phrase from the dawn song (Fig. 1C) but is a rising-falling slur (Fig. 4C) which could be paraphrased "oéeoh." This was called by Downer and Sutton (1990) "A plaintive "pee" at various tonal levels." Another vocalization was heard and taped during an interaction between two birds. A nearby bird gave the "weeléeah" and "oéeoh" phrases, as a distant one added a monotonous series of "duu duu" calls (Fig. 4A), continuing them when it flew in closer (Fig. 4B).

Plumage.—In general appearance, Greater Antillean Pewees are small,

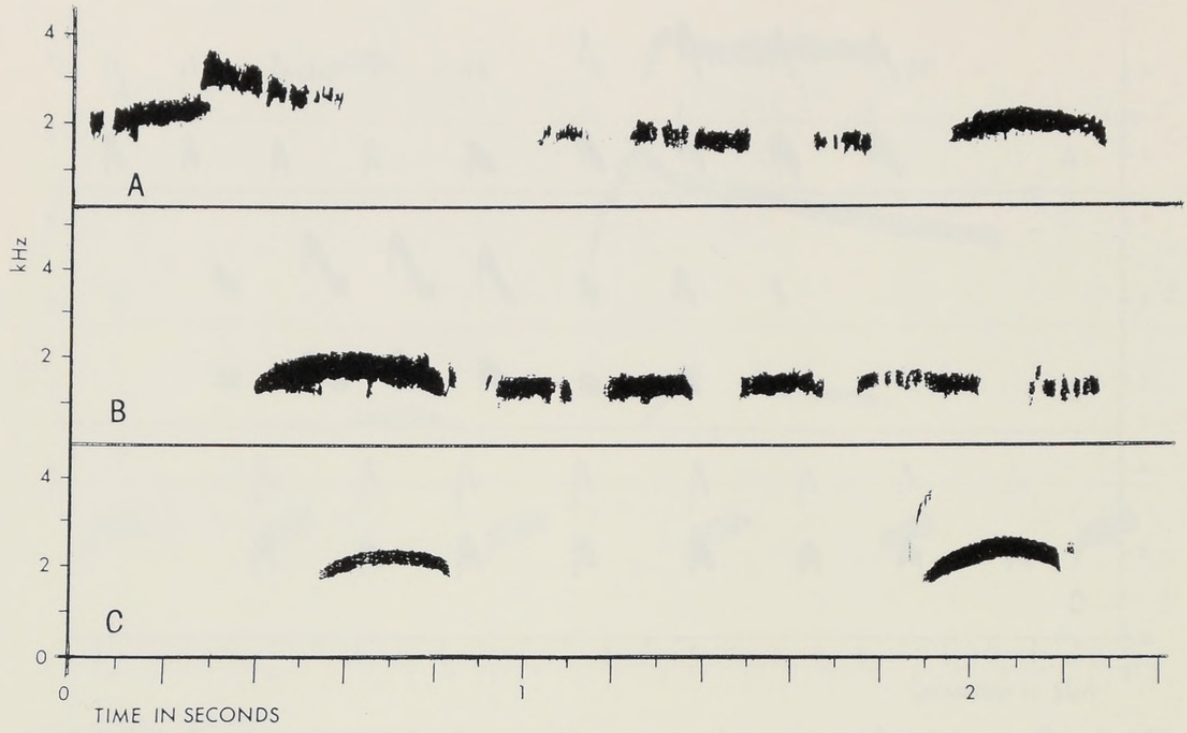

FIG. 4. Sonograms of two interacting pewees in Jamaica, including slurs from one and more uniform "duu" calls from the second bird (A), continuing closer together (B), and the common daytime call (C).

rather drab flycatchers. Two wing bars may be present, light grayish to buffy, but they are often inconspicuous or absent. The tail is notched. Upperparts are dark, with varying degrees of grayish or olive-brown, and the crown is darker than the back. Underparts are lighter, whitish, or grayish with washes of olive, yellow or brown. The maxilla is brown to black, and the mandible is yellow to buffy. With the exception of wing bars, there are no sharply defined lines of color change between plumage areas.

Some inter-island plumage differences were found. The contrast between a dark crown and lighter back is greatest in Cuban birds. The center of the breast and abdomen is lighter colored in Bahaman birds (Illus. D). This feature was noted by Kaufman (1984), who described it as "sometimes creating a "vested" appearance." Specimens from Jamaica may also show lighter feathers in the center of the breast or abdomen, and this is evident in a color photo and plumage description by Downer and Sutton (1990).

The most striking feature is the vertical crescent at the rear of the eye in birds from Cuba (Illus. A and B) and the Bahamas (Illus. C and D), but not in the examples from Hispaniola and Jamaica (Illus. F, G, and H).

In the first edition of "Birds of the West Indies," Bond (1936) referred

to a "narrow white orbital ring" which was shown in the black and white illustration in this and all later editions. Beginning with the 1974 edition (Bond 1974), a color plate shows a ring, perceptibly lighter, at the back of the eye, but not of the proportions shown in the living birds here (Illus. A, B, C). Patterson (1972), Brudenelle-Bruce (1975) and Kaufman (1984) all noted this field mark in their reports of Bahaman birds, but it has not been noted previously in reports of birds in Cuba.

Another feature, much less striking than the above, is the somewhat lighter color of the lores (Illus. C), apparently confined to birds in the Bahamas, and there it is not always present. In observing pewees there, Kaufman (1984) stated that "among some 50 individuals . . . some had a pale area on the lores." This characteristic is shown in the pen and ink sketch by Earl L. Poole, in all of Bond's editions, but he made no mention of the character in his texts. A specimen from the Bahamas was apparently supplied to the artist for his model. (An artifact produced the small white spot shown on the lores of a Cuban bird here [Illus. B].)

Mensural data.—For the most part, variations among populations were small, but some significant differences were found (Tables 1 and 2). Values from Jamaican birds showed lighter masses and shorter tails, tarsis, wings and bills, than values from birds in Cuba. The bill width in Jamaica was also smaller than bill width in Hispaniola and the Bahamas. Most of the other values for these two populations were intermediate between those from Cuba and Jamaica, except that tail length is shortest in birds from the Bahamas.

DISCUSSION

The differences in dawn songs among the Jamaican, Hispaniolan, and Cuban-Bahaman populations of pewees are similar in magnitude to those found in *Myiarchus* by Lanyon (1967, 1978), suggesting species separation. Also supporting species recognition is the fact that *no* vocalizations we heard and recorded in one population were heard in either of the other two.

We have examined sonograms and listened to dawn song tape recordings of several other *Contopus* species, including Olive-sided Flycatcher (*C. borealis*), Coue's Flycatcher (*C. pertinax*), Dark Pewee (*C. lugubris*), Western Wood-Pewee (*C. sordidulus*), Eastern Wood-Pewee, Tropical Pewee (*C. cinereus*), and Lesser Antillean Pewee (*C. latirostris*). There were no strong leads to suggest the derivation of Greater Antillean Pewees. There were, however, two similar pairs of vocalizations. The Eastern Wood-Pewee "wee-ooo" phrase (Fig. 5A), with its rising-falling high pitched slur, resembles the phrases of the pewee in Cuba (Figs. 1A, 2B, 2C), and each attains 4 kHz or higher in pitch. The "wee-ooo" is the well-

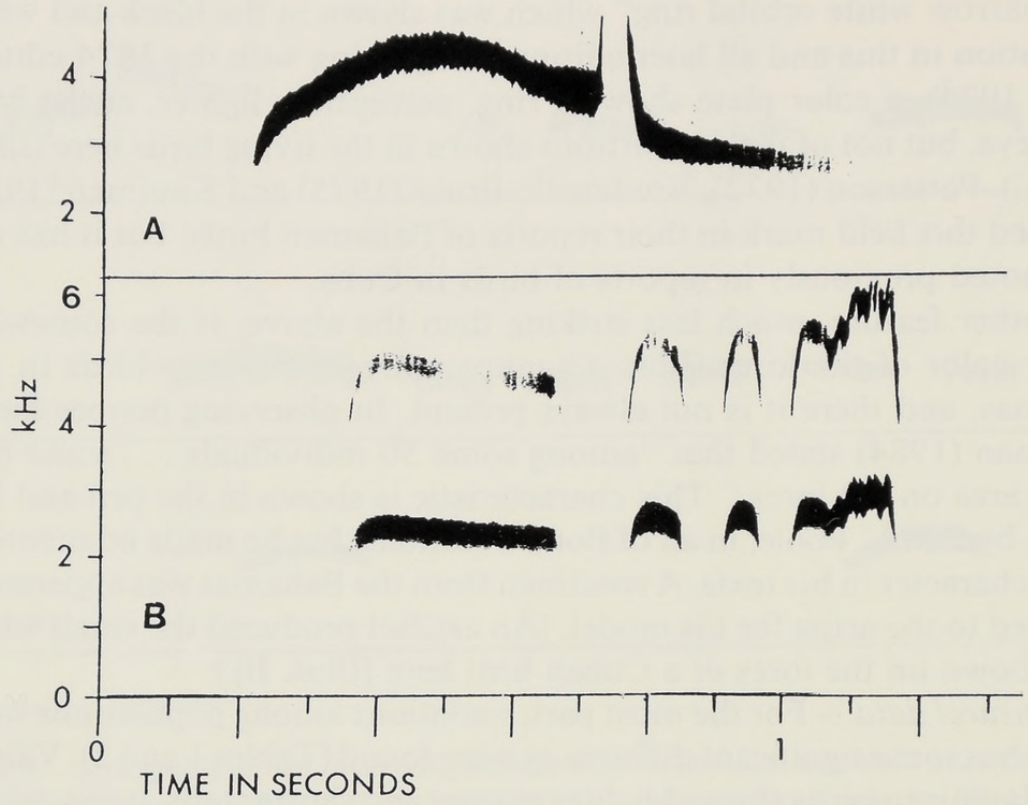

FIG. 5. Sonogram of the second phrase of Eastern Wood-Pewee dawn song in Pennsylvania (A) and sonogram of a Lesser Antillean Pewee dawn song in Guadeloupe (B).

known second phrase of early morning singing of Eastern Wood-Pewees described by Craig (1943) and referred to as "song form 2" by Smith (1988).

The second similarity is in the pattern and pitch of a Lesser Antillean Pewee in Guadeloupe (Fig. 5B), recorded by Roché (1971), and a dawn song we recorded in Hispaniola (Fig. 1B). Each of these is loud and emphatic in delivery and in the 2–3 kHz frequency range.

Regarding the status of pewees in the Bahamas, Wetmore (1932) stated "I consider the wood pewee of Cuba specifically distinct from that of the Bahamas, although Dr. Hellmayr (1927) has treated them as geographic representatives of the same species." Barbour (1923) commented, "The Bahaman bird represents a valid subspecies, being slightly larger and more ashy in color." Our studies support only subspecific separation. Although there are some minor plumage differences, the two populations have a very similar dawn song type (Figs. 1A, 2A), and each has the prominent "post-ocular spot."

Nomenclature.—The first description and naming of the pewee in Jamaica was *Myiobius pallidus* Gosse (1847), in "Birds of Jamaica," the first comprehensive treatment of its avifauna. Several other genera were later used, as given in Ridgway (1907), and Hellmayr (1927), including *Blacicus, Pyrocephalus, Rhyncocyclus* and *Tyrannula,* with the first usage

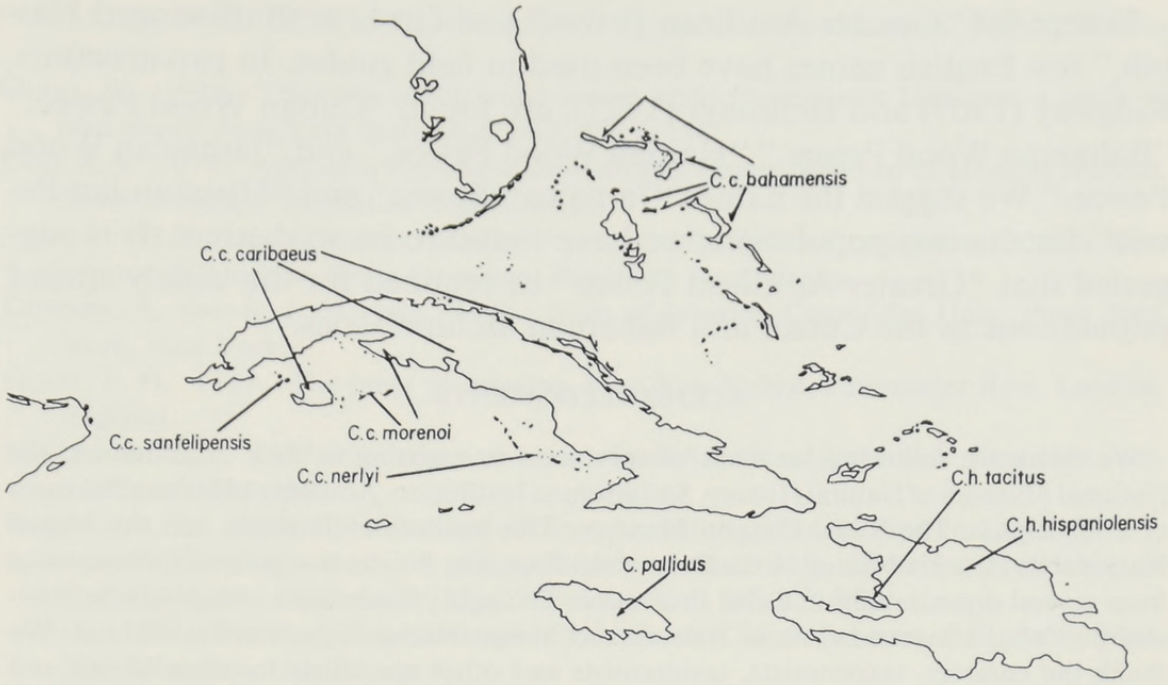

FIG. 6. Map of distribution of *Contopus* in the Bahamas, Cuba, Jamaica, and Hispaniola.

of the current genus in *Contopus pallidus* by Sclater (1862). It was reduced to sub-specific status in two combinations, *C. caribaeus pallidus* by Baird et al. (1874) and *Blacicus caribaeus pallidus* in Hellmayr (1927) and Bond (1936). Finally, the population in Jamaica was included as a part of *Contopus caribaeus* in Bond's 1974 and subsequent editions of "Birds of the West Indies," as well as in the AOU check-list (1983).

In Hispaniola, the pewee was first designated *Tyrannula cariboea* (sic.) var. *T. c. hispaniolensis* Bryant (1866). It was then considered a full species, *Contopus hispaniolensis* Bryant, Cory (1885), and by Ridgway (1907) who used *Blacicus hispaniolensis* Bryant. Hellmayr (1927) and Bond (1936) both reduced it to *B. caribaeus hispaniolensis.* Again, as with the pewee in Jamaica, Bond (1974) and the AOU (1983) included the pewee in Hispaniola as part of *Contopus caribaeus.*

In contrast with past studies, we have had the opportunity to study differences in taped vocalizations, new mensural data, and new close-up photographs of live pewees. This information, along with our collective field experience, leads us to believe we are dealing not with one but three species. We suggest, in essence, the return of the Jamaican and Hispaniolan populations, now sub-species, to their earlier described status as full species.

For Jamaica, we propose the taxon, *Contopus pallidus* Gosse (1847), first used by Sclater (1862). For Hispaniola, we propose returning to *Contopus hispaniolensis* Bryant (1866), chosen also by Cory (1885). The geographic distribution is shown on the map (Fig. 6).

Except for "Greater Antillean Pewee" and Gosse's "Buff-winged Flatbill," few English names have been used in field guides. In two accounts, Ridgway (1907) and Hellmayr (1927), are found "Cuban Wood Pewee," "Bahaman Wood Pewee," "Haitian Wood Pewee," and "Jamaican Wood Pewee." We suggest the names "Jamaican Pewee" and "Hispaniolan Pewee" for the two populations we have found to be so distinct. It is suggested that "Greater Antillean Pewee" be retained for the widely spread populations in the Cuban and Bahaman archipelagoes.

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