over-water flight by adjusting their heading toward Cuba. Island-hopping to Cuba would reduce length of the water crossing by 50% of the direct over-water flight distance to the Yucatan peninsula. However, migrant sharp-shins are only rarely recorded in Cuba (Palmer 1988).

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Bird species on St. Andrew and Old Providence Islands, West Caribbean.—The Islands of St. Andrew and Old Providence (as called by their inhabitants), or San Andrés and Providencia as called by Colombia which governs them), lie in the SW Caribbean about 200 km east of Nicaragua, comparatively isolated from the rest of the West Indies. These oceanic islands have a resident bird fauna of 16 species, mainly of West Indian affinities (Bond 1950, 1988). The two islands are separated by about 100 km, and many of the birds resident on both are represented by different subspecies on each (Bond 1950).

Old Providence is about 8 × 5 km, with a 1-km diameter islet, St. Catherine (Santa Catalina), off its northern end. It is volcanic, with steep hills, several rising to between 350 and 400 m. The coast is mainly rocky with small sandy beaches, many backed by dry mangrove woodland, which merges with dry thorn woodland as the land rises. Much of the

lowlands have been converted to cattle pasture or farmland, but extensive dry woodland remains on the main island and on St. Catherine. The upper slopes of the hills, especially in the south, are largely clothed with native forest, and the island is not "most(ly) . . . deforested and devoted to cattle ranching" as stated by Hilty and Brown (1986).

By contrast, St. Andrews is a low coral island about 13 × 4 km, rising to only 100 m along its central ridge. Most of the island is urbanized (northernmost 20%) or converted to coconut plantations (southern half), with farmland in between. Native vegetation is restricted to small patches of trees and scrub amongst the farmland and settlements.

Early visits by ornithologists are listed by Bond and Meyer de Schauensee (1944). Subsequently, both islands were visited in 1948 by Bond (1950) and in 1972 by Russell et al. (1979), while St. Andrew was visited in 1966–1967 by Barriga et al. (1969) and Paulson et al. (1969) and in 1983 by Nash (Barlow and Nash 1985).

We visited the islands from 26 February to 5 March 1989, with five days (27 February–3 March) on Old Providence and the remainder on St. Andrew. Since Bond's visit in 1948, the only documented ornithological results from Providence were by Russell et al. (1979) who spent two days there in April 1972. We had adequate time on Old Providence to examine all major habitats except the extensive mangroves below the airport on the east coast. We spent only one afternoon (26 February) and one day (4 March) observing birds on St. Andrew, visiting the town and harbor, shoreline along the north and east coast (mainly sandy, with rocky areas), El Cove on the west coast, and coconut plantations, farmland, and patches of native vegetation in the interior. However, our visit to St. Andrew was too short to sample the avifauna adequately.

We use the following conventions: very abundant—>100 seen or heard in suitable habitat per day; abundant—11–100; common–10; frequent–several may be seen but not every day; records of rarer species are given in full detail. Where a subspecific name is used, the subspecies is endemic to the islands.

Resident Species

White-crowned Pigeon (*Columba leucocephala*). Abundant in dry woodland and hill forest on Old Providence (P). Not seen on St. Andrew (SA).

White-winged Dove (*Zenaida asiatica*). On P, Very abundant in all types of woodland, also seen in gardens and flying over fields. One seen SA, north central area.

Mangrove Cuckoo (*Coccyzus minor abbotti*). Common in dry woodland on P, where seen courtship feeding and copulating. Not seen SA. Bond (1950) also found it common on P and "rather rare" on SA, while it was not seen at all by Paulson et al. (1969) or Russell et al. (1979).

Smooth-billed Ani (*Crotophaga ani*). Common in farmland on P (rare according to Russell et al. 1979). Not seen SA. Thought by Bond (1950) to have arrived on the islands about the early 1940s; the first probable sight record was in 1941 (Bond and Meyer de Schauensee 1944).

Green-breasted Mango (*Anthracothorax prevostii hendersoni*). Common on P in dry woodland and gardens. Two seen SA, north central area.

Caribbean Elaenia (*Elaenia martinica cinerescens*). Abundant in dry woodlands and hill forest on P. Not seen SA.

St. Andrew Mockingbird (*Mimus magnirostris*). (Species endemic to SA; by some regarded as a race of Tropical Mockingbird [*M. gilvus*].) Common in north central area in scrub, farmland and gardens.

St. Andrew Vireo (*Vireo caribaeus*) (species endemic to SA; there are no records for P, contrary to Hilty and Brown 1986). Common in undergrowth of shrubby areas in north-central area.

Thick-billed Vireo (*V. crassirostris approximans*). Abundant in shrubby areas, dry woodland, and hill forest. There are no records for SA, contrary to Hilty and Brown (1986).

Black-whiskered Vireo (*V. altiloquus grandior* [P]; *V. a. canescens* [SA]). Only one seen on P, in dry woodland. None seen SA.

Bananaquit (*Coereba flaveola tricolor* [P]; *C. f. oblita* [SA]). On both P and SA very abundant in all habitats with trees or bushes. On P seen carrying nest material and visiting complete nests.

Jamaican Oriole (*Icterus leucopteryx lawrencii*) (SA only). One seen in trees edging a field and banana plantation, north central area.

Black-faced Grassquit (*Tiaris bicolor grandior*). Abundant throughout P in open vegetation and along roadsides; seen feeding fledglings. Very abundant SA in all open habitats including farms, plantations and roadsides.

The following three resident species, two of which have also been recorded as migrants, were not found by us: Green-backed Heron (*Butorides striatus*) (both islands); Caribbean Dove (*Leptoptila jamaicensis neoxena*) (SA); Yellow Warbler (*Dendroica petechia armouri*) (P), (*D. p. florida*) (SA). It is surprising that the Green-backed Heron and Yellow Warbler eluded us on Old Providence, the only resident species to do so. We visited several coastal and mangrove areas and would have expected to have found such a noisy, conspicuous bird as the Green-backed Heron. The endemic subspecies of the Yellow Warbler was reported by Bond (1950) to be one of the rarest resident birds on Old Providence, and Russell et al. (1979) also failed to find it. Some concern might be expressed about the survival of this well-marked race. The endemic race of the Black-whiskered Vireo also seems rare (only one individual seen) and must therefore be vulnerable to extinction.

Given the brevity of our visit to St. Andrew, it is not surprising that we failed to locate these three species and others on that island.

Other apparent changes in status since the visit of Russell et al. (1979) concern the two cuckoos. The Mangrove Cuckoo was not found by Paulson et al. (1969) or Russell et al. (1979), but we found it to be common on Old Providence. Considering the amount of time spent by Paulson et al. and Russell's party on St. Andrew and the shortage of its apparently preferred habitant (dry woodland and mangroves) there, it seems possible that the St. Andrew population may no longer exist. However, the population on Providence seems healthy at present. The Smooth-billed Ani, thought rare by previous visitors, now seems well-established on Old Providence.

Nonresident Species

Presumed non-resident species recorded during our visit include three species not previously documented from either island, all here recorded on Old Providence. One Parasitic Jaeger (*Stercorarius parasiticus*) was present in the shallows between Providence and St. Catherine, 27–28 February. Its occurrence on Providence is not unexpected; it is a species which might be expected to wander occasionally to that part of the Caribbean. A Scarlet Macaw (*Ara macao*) was seen free-flying and apparently wild, away from human habitation, near Southwest Bay. It seems most likely to have been an escape from captivity, but the nearest mainland source area is Nicaragua, only 200 km away, from where Bond (1950) presumed that the resident Green-breasted Mango originated.

We found Yellow-green Vireos (*V. flavoviridis*) to be common in dry woodland in the lowlands of Providence. The birds were watched at close range and could be clearly distinguished from the similar but much larger resident races of Black-whiskered Vireo by their size, short bills and lack of malar streak. A Red-eyed Vireo (*V. olivaceus*) was collected on 31 March 1941, on Albuquerque Keys (12°12'N, 81°50'W, 40 km SSW of St. Andrews) (Bond and Meyer de Schauensee 1944), but the birds we saw were referred to Yellow-green

Viro by their green upperparts, yellow on underparts, and lack of dark outline to the creamy-white supercilium. Further, the migration of Red-eyed Vireo probably occurs later in the spring (Skutch 1960). The lack of previous records of Yellow-green Vireo on Providence could be due to previous visits by ornithologists not having coincided with the peak migration time (e.g., Bond 1950) or being of short duration (Russell et al. 1979). However, Yellow-green Vireos breed in Central America and do not appear to have been recorded previously in the West Indies. They may be regular migrants on St. Andrew and Old Providence.

We recorded six additional species which were not previously known on Old Providence and two additional species not formerly reported from St. Andrew. On Providence we recorded Brown Pelican (*Pelecanus occidentalis*) (one present 27 February–1 March in shallows between Providence and St. Catherine), Cattle Egret (*Bubulcus ibis*) (common in open areas, especially grassland), Yellow-crowned Night-Heron (*Nyctanassa violacea*) (frequent in mangroves, especially on St. Catherine), Willet (*Catoptrophorus semipalmatus*) (frequent around the coast), Tennessee Warbler (*Vermivora peregrina*) (one in dry woodland), and Common Yellowthroat (*Geothlypis trichas*) (one in dry woodland). On St. Andrew, we found Greater Yellowlegs (*Tringa melanoleuca*) (one at El Cove) and Black-throated Green Warbler (*Dendroica virens*) (one in scrub).

Most non-resident land birds were found in the dry woodland at low altitude, where we spent much observation time. Very few species were found in the hill forests. Although we spent only one day at higher altitude, we formed the impression that bird densities were lower there. We saw very few migrant warblers in the hill forest but many in the dry woodland just below it, on the same day. Further, resident birds seemed less common in the hill forest.

Previous authors have listed all herons but the Green-backed Heron as non-resident, although it seems more likely that some are resident breeders. This particularly applies to the Cattle Egret and Yellow-crowned Night-Heron, both of which are now known to occur on both islands and which are present in good numbers. The remaining species which we report from one or other of the islands for the first time, apart from the Brown Pelican, are Nearctic migrants, either shorebirds or warblers.

Assuming that the seabirds and herons (apart from the Green-backed Heron) are not resident, our records bring the total of non-resident birds recorded from the islands to 81 (57 on Old Providence, 72 on St. Andrew) with 12 residents on Providence and 15 on St. Andrews. The number of new non-resident species found per ornithological visit seems to be declining on St. Andrew (unpubl. data), indicating that the total number of non-resident species which visit it regularly is about 70. By comparison, Old Providence appears understudied, and it is likely that it will eventually be found to hold as many regular non-residents as St. Andrew, perhaps more, considering that it has a greater variety of habitats and more natural woodland.

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Body measurements of Boreal Owls in Idaho and a discriminant model to determine sex of live specimens.—The recognized distribution of Boreal Owls (*Aegolius funereus*) in North America has expanded significantly in the past seven years (Palmer and Ryder 1984, Hayward et al. 1987, O'Connell 1987, Stahlecker and Rawinski 1990). As interest in the Boreal Owls of the western United States increases and population studies become important in assessing species status, reliable identification of sex and age will be useful. Here we report the body measurements of 58 adult Boreal Owls captured in Idaho and describe a discriminate model for sexing the birds.

During studies of Boreal Owl habitat use in 1980–1987, we captured and measured 14 male and 11 female Boreal Owls in Chamberlain Basin of the Frank Church—River of No Return Wilderness of central Idaho. We captured the owls at night, on bal-chatri traps or in mist nets at calling sites during winter and spring. We recaptured and remeasured some individuals when their radio-transmitters needed replacing. During an associated investigation evaluating nest boxes as a tool to monitor Boreal Owl populations, we captured and measured eight males and 24 females at nest boxes near McCall, Idaho from 1988–1990. We captured an additional female at a nest box in northern Idaho in 1989.

Because the owls at Chamberlain Basin were radio marked, we could observe their behavior during courtship and nesting and thereby determine each bird's sex. Owls observed singing the staccato song (Bondrup-Nielsen 1984) and/or seen delivering prey to a nest cavity occupied by another Boreal Owl were classified as males. Owls that incubated eggs, brooded young, or otherwise occupied a cavity day and night for at least a week were classified as females (Mikkola 1983). Similarly, owls captured during the nest box study were classified by behavior.

We weighed owls with a 300-g Pesola scale to the nearest g. A wing tracing was made without overextending the wing and its area was measured using a planimeter. We recorded wing length (wing chord) as the distance from the carpal region of the bent wing to the tip