

*This large cotinga is endemic to Costa Rica and western Panama, where it breeds in adequately protected highland forests, but winters in severely threatened lowland forest. The species is generally uncommon and local throughout its range, although little is known of its status or ecology.*

**DISTRIBUTION** The Bare-necked Umbrellabird is recorded from the tropical belt to well up in the foothills and highlands of chiefly the Caribbean slope of Costa Rica and western Panama.

**Costa Rica** This species is sparsely distributed in the lowlands and foothills of Cordilleras Guanacaste, Tilarán and Central, and in the Dota mountains (Slud 1964). Localities have been traced from maps in Carriker (1910) and Slud (1964). Records (from approximately north-west to south-east) are from the following localities:

*Cordillera Guanacaste* La Vijagua (Bijagua) at the headwaters of the río Zapote on the northern slope of Volcán de Miravalles (Carriker 1910), where four birds (in ANSP, MCZ) were taken in February–March and October 1908, and whence come repeated recent records (F. G. Stiles *in litt.* 1991); Rincón de la Vieja, where birds (probably breeding) were seen at 1,500 m in March 1989 (F. G. Stiles *in litt.* 1991);

*Cordillera Tilarán* El Silencio, where a female (in DMNH) was taken in February 1954; Monteverde Biological Reserve, where the species has been noted in the Peñas Blancas valley (M. P. L. Fogden *per* F. G. Stiles *in litt.* 1991, also Taylor 1990), Slud (1964) recording it from the Pacific-facing slope of the cordillera (although there are no locality data to support this); San Carlos (apparently between Commandancia de San Carlos and the confluence of río Arenal and río San Carlos), where the bird was taken at 915 m in February 1877 (Boucard 1878a, Carriker 1910);

*Cordillera Central* Cataratas River (apparently part of the upper río San Carlos, and presumably near Cataratas) where a group of males was seen displaying daily during April and May 1942 (Delacour 1943, Wetmore 1972); El Zarcero de Alajuela (Carriker 1910); Barranca (on the west slope of Volcán Poás), where a male (in AMNH) was collected in March 1867; Cariblanco de Sarapiquí, where two males (in ROM) were taken at c.840 m in 1902 and 1903; Finca La Selva, where (between 100 and 220 m) the bird is a non-breeding visitor from August to March (Slud 1960); La Selva Biological Reserve, Rara Avis, and Braulio Carrillo National Park between 300 and 1,100 m (Taylor 1990, B. M. Whitney *in litt.* 1991; see Ecology), a specimen (in MZUCR) being taken at Cantarrana (300 m) low down in the national park in February 1983, with displaying males seen in March each year (1981–1983) at La Montura (F. G. Stiles *in litt.* 1991); San José, over which a bird was seen flying on 4 April 1983 (B. M. Whitney *in litt.* 1991; also Salvin and Godman 1888–1904); Carrillo, where two males (in ROM) were taken during June 1906; La Honduras, where a female (in MCZ) was taken in May 1899, a male (in AMNH) at 915 m in April 1924, and two males (in LACM, YPM) between 1,220 and 1,400 m in March 1929; La Palma de San José, where a female (in USNM) was collected in March 1880; Volcán Irazú, where birds were taken in May 1877 (Boucard 1878a, Carriker 1910); the foothills of the north side of Volcán Turrialba, where birds were noted in August (Slud 1960); Coliblanco, where a bird (in USNM) was taken in May 1905 (Carriker 1910); Naranjo de Cartago (now known as Juan Viñas: Carriker 1910), where a male (in LSUMZ) was taken in March 1888; Tucurriqué (male in BMNH, no date) (Salvin and Godman 1888–1904); Guayabo (apparently a station on the railway between Juan Viñas and Turrialba: Carriker 1910), where a female (in YPM) was taken at 1,220 m in April 1926; Turrialba (the town, not Volcán), where six birds (in BMNH) were collected in 1864, with a seventh (in BMNH) taken in May 1865 (Salvin 1867 referred to these as from “near Turrialba”), and a male (in AMNH) taken in May 1893; Angostura (opposite Turrialba, and just below the Tuís valley), where a female (in USNM) was collected in July 1866; Bonilla, where a female (in USNM) was taken on 31 March 1905; Hacienda La Iberia, where a male (in LACM) was taken at 300 m in December 1927;

*The Old Line Railway* La Cristina (presumably close to but north of the railway, along the río Cristina), where a male (in ROM) was taken in February 1907; Jiménez (Carriker 1910); El Hogar, where a male and female (in CM) were collected in March 1907 (also Carriker 1910); Guácimo, where a female (in CM) was taken in October 1903, a female (in BMNH) in November 1905, a male (in BMNH) in February 1907, and a female (in AMNH) at 150 m in March 1925 (also Carriker 1910); Siquirres, where a male and female (in FMNH) were collected in April 1894; Viveros Salsipuedes Farm (18 km east of Siquirres, and through which the río Madre de Díos flows), between 100 and 550 m (Taylor 1990); Limón (seemingly referring to the port, or the hills just behind), where a male (in FMNH) was taken in May 1910;

*Dota mountains* including a male (in MCZ) from “Dota” taken in February 1867, and a record from Santa Maria de Dota (Carriker 1910); and from sea level somewhere along the río Sixsola (= Sixaola), where a pair was seen (female in CM) in August 1904 (Slud 1964). The birds seen on the río Sixaola suggest that the Bare-necked Umbrellabird is to be found in the Cordillera Talamanca proper (Slud 1964), although whether the birds (on the río Sixaola) originated from the Costa Rica or Panama side of this cordillera is pure speculation. The sighting of a single umbrellabird at Hitoy Cerere Biological Reserve in July 1985, further pointing to the presence of at least a local breeding population on the Caribbean slope of this cordillera (F. G. Stiles *in litt.* 1991).

**Panama** The Bare-necked Umbrellabird has been found at few localities in the foothills and highlands of the states Bocas del Toro, Chiriquí and Veraguas, descending to the lowlands on the Caribbean slope at least in Bocas del Toro. Coordinates are from OG (1969).

Records (approximately from west to east) come from Boca del Drago (9°25'N 82°20'W) on the coast of Bocas del Toro, where a bird was collected in August 1960 (Wetmore 1972); at the headwaters of the río Changuena (c.9°09'N 84°49'W) between Cerro Fabrega and Cerro Robalo, where a female (in USNM) was taken in July 1960; Chiriquí (at 2,440 m) where the type was taken in 1849 (Gould 1850, Wetmore 1972), Wetmore (1972) adding more detail, saying that this was between Laguna de Chiriquí and David (above Boquete), probably on the north slope at 1,600 m or less (three specimens in AMNH from “Chiriquí”); Boquete (c.8°47'N 82°26'W), where a male and two females (in MCZ) were taken at 1,220 to 1,830 m in March and April 1901 (“above Boquete” in Wetmore 1972), and a female (in AMNH) at 1,070 m in April 1903; Finca Lerida (8°48'N 82°29'W; above Boquete), where two birds were seen at c.1,600 m in July 1964; the Fortuna area (c.8°43'N 82°16'W) of the upper río Chiriquí valley, especially within the drainage of Quebrada de Arena, whence come reports of small numbers in recent years (Ridgely and Gwynne 1989); Cedral (untraced, but in Bocas del Toro), where a male and female (in FMNH) were taken at 1,460 m in July 1933 (see Wetmore 1972); Cordillera de Tolé (c. 8°20'N 81°48'W), where two males (in BMNH, USNM) were taken in 1866 (also Salvin 1867); Calovévora (presumably either at “Pico Calovevora” or in the foothills along the river: see Salvin 1870), where a male (in BMNH) was taken in 1868; Calobre (8°19'N 80°51'W), a locality mentioned by Salvin (1870), but which Wetmore (1972) suggested “may have been in error for Calovévora” as it was not mentioned in any later accounts.

**POPULATION** A significant number of the localities in both Costa Rica and Panama are represented by small numbers of specimens (quite often just 1-2 old ones), but with the non-breeding population thinly scattered in available habitat, and relatively few localities where (quantitative) repeat observations have been made, more than a rough assessment of the population is almost impossible.

**Costa Rica** Salvin (1867) claimed that the Bare-necked Umbrellabird appeared to be abundant near Turrialba and in Cordilleras de Tole, although Carriker (1910) wrote that it is “not an abundant bird, and but few individuals are seen”. Slud (1964) suggested that the bird is encountered haphazardly and locally, occurring singly in its wintering grounds (see Ecology) but in small groups during its seasonal migrations, and in leks when displaying. At Finca La Selva (a wintering ground) birds were normally seen alone, but at times in twos and threes, the species here assessed as being rare to uncommon when present (Slud 1964), this generally being the case in lowland areas (F. G. Stiles *in litt.* 1991). Wetmore (1972) and M. P. L. Fogden (*per* F. G. Stiles *in litt.* 1991) recorded groups of displaying males on the upper río San Carlos, Monteverde (Peñas Blancas valley) and Braulio Carillo National Park, between 800 and 1,600 m. The size of these groups is generally 3-6 males, but the number of leks and the catchment area of each display site is unknown and consequently the population density or local population sizes are impossible to judge. Stiles and Skutch (1989) summarized the species in Costa Rica as being uncommon and local.

**Panama** The Bare-necked Umbrellabird is generally considered to be rare (Ridgely and Gwynne 1989), and never seems to have been common (being known from relatively few specimens: see Distribution) (Wetmore 1972), although Salvin (1867) claimed that it appeared to be common in the Cordillera de Chiriquí. The bird is now considered “very rare” in the western Chiriquí highlands, but probably more numerous on the Caribbean side of the mountains, although even here there are relatively few reports (Ridgely 1981b, Ridgely and Gwynne 1989). Small numbers have been found in recent years in the

Fortuna area (see Distribution).

**ECOLOGY** The Bare-necked Umbrellabird undertakes a seasonal vertical migration, breeding in the wetter parts of the cool subtropical belt (occasionally higher) and apparently spending the rest of the year in the foothills down to the edge of the coastal plain (Slud 1964; see below). Despite this migration, birds are always found in (or close to) dense humid primary forest, where they primarily inhabit the upper understorey to mid-canopy (although ground level to treetops have been noted), and sometimes visit fruiting trees in adjacent tall second-growth or semi-open areas (old-style cacao plantations) (Slud 1960, Stiles and Skutch 1989, F. G. Stiles *in litt.* 1991).

Birds feed on the fruits of palms, Lauraceae, Annonaceae, and some large insects (including orthopterans and caterpillars), small lizards and frogs (Stiles and Skutch 1989), and during the non-breeding season have been noted to accompany fruitcrows *Querula* sp. and nunbirds *Monasa* sp. etc. (Ridgely and Gwynne 1989).

The breeding season is between March and June (F. G. Stiles *in litt.* 1991), birds leaving the lowlands (e.g. La Selva) in December–January, and migrating upslope to 800–1,400 m in Costa Rica, and 1,070–1,830 m in Panama (see Distribution: F. G. Stiles *in litt.* 1991). Stiles and Skutch (1989) quoted 800–2,000 m for Costa Rica (rarely to 2,000, but regularly to 1,500–1,600 m: F. G. Stiles *in litt.* 1991); Ridgely (1981b) 1,220–2,440 m and later Ridgely and Gwynne (1989) 900–1,200 m for Panama. Although birds most often occur singly, during seasonal movements they occur in small groups (Slud 1964) which prior to breeding may include displaying males (Stiles and Skutch 1989). Birds generally leave their wintering grounds during March (see Distribution), with almost all birds gone from Finca La Selva by the end of March (one seen in April: Slud 1960). Males have been observed displaying during April and May at 915 m on the upper río San Carlos (Wetmore 1972), and from late March through early April at c.1,300–1,400 m in Monteverde Biological Reserve (Taylor 1990), and during March and the first week of April (1981–1983) at 1,000–1,100 m in Braulio Carrillo National Park, although at La Montura (inside the park), migrating groups of 2–4 males only display for c.1–2 weeks before moving further upslope, breeding mainly at 1,200–1,600 m (e.g. on Volcán Barva) (F. G. Stiles *in litt.* 1991, B. M. Whitney *in litt.* 1991). Stiles and Skutch (1989) stated that the birds display from March to May or June. Displaying is undertaken by loose groups (3–6 birds) of males (leks) perched in the subcanopy (Stiles and Skutch 1989, F. G. Stiles *in litt.* 1991), c.5 m or more above the ground (Wetmore 1972). No nest has ever been described (Ridgely and Gwynne 1989, Stiles and Skutch 1989: see Remarks), although M. P. L. Fogden (*per* F. G. Stiles *in litt.* 1991) has found one in the Peñas Blancas valley.

Birds are noted in the warmer Caribbean lowlands from the end of July (when one seen at Finca La Selva), with most reappearing in August (when a “small wave” is noted at Finca La Selva) (Slud 1960).

Other August lowland records include a pair at sea level on río Sixaola (9 August: see Distribution); on the northern side of Volcán Turrialba (Slud 1960); one at sea level from Boca del Drago (25 August: Wetmore 1972); and two together at 300 m in mid-August 1981 in the valley of the río La Patria, Braulio Carrillo National Park (B. M. Whitney *in litt.* 1991). Stiles and Skutch (1989), based on observations over a large number of years, suggested that females winter chiefly below 200 m (nearly all birds at La Selva being females), with the males staying higher up (between 100 and 500 m; also F. G. Stiles *in litt.* 1991).

**THREATS** The Bare-necked Umbrellabird is seemingly rare over most (or all) of its range, and is threatened by deforestation over significant areas (Ridgely and Gwynne 1989). Although the bird was probably always uncommon to rare, it now faces the problem of lowland forest destruction (F. G. Stiles *in litt.* 1991). Since 1940, half of Costa Rica's forest has been destroyed, and the remainder (primarily lowland forest) is being lost at a rate of 3% of the country's land area per year, the lowlands and foothills of the northern Caribbean slope being one of the regions of most active deforestation (Stiles and Skutch 1989). The problem of deforestation is exacerbated by the fact that this species requires both lowland (for up to eight months of the year) and foothill or highland forests in order to complete each annual cycle: most protected areas in Costa Rica are in the highlands (e.g. the highland area of La Amistad International Park represents half of the land area currently protected within Costa Rica), and at no point is a large lowland park connected by a broad wooded corridor with a highland protected area (Stiles and Skutch 1989). It is anticipated that, owing to continuing deforestation, most of Costa Rica's forest will lie within the current protected areas system within a few years, and consequently the highland avifauna will be relatively more secure than that of the lowlands (Stiles and Skutch 1989). Although La Amistad

International Park may harbour a breeding population of this species (though as yet unrecorded), there are no adjacent sizeable tracts of lowland forest to retreat to after the breeding season, and certainly none within a protected area (see Stiles and Skutch 1989), the only suitable area being across the border in Panama (see below).

The situation in Panama in relation to deforestation is similar to that in Costa Rica, although owing to the inaccessible nature of and resultant untouched forest on the Caribbean slope, the Bare-necked Umbrellabird is presumed to be more numerous and less threatened there (Ridgely and Gwynne 1989). Recent highway construction has opened up the La Amistad region area to settlement and land clearance (*Ancon Newsletter* 1 [1988]: 1).

**MEASURES TAKEN** In Costa Rica, this species is known to occur in Rincón de la Vieja National Park, where it probably breeds (although no lowland areas nearby are protected); Monteverde Biological Reserve, where it breeds; La Selva Biological Reserve, where it winters; Braulio Carrillo National Park, where it breeds; Hitoy Cerere Biological Reserve; and possibly within La Amistad International Park, although there are no records to confirm this (see Distribution). An old record (1867) comes from the area of present-day Volcán Poás National Park, but the species's present status there is unknown. In Panama, the Bare-necked Umbrellabird almost certainly occurs on the Panama side of La Amistad International Park (207,000 ha), and in the contiguous Volcán Baru National Park (14,000 ha) (Morales and Cifuentes 1989).

**MEASURES PROPOSED** The best chance of saving habitat for altitudinal migrants such as the Bare-necked Umbrellabird lies in preserving and broadening the forest connection between La Selva Biological Reserve and Braulio Carrillo National Park (Stiles and Skutch 1989). Other priority areas for protection should be the lowland forests to the north and east of the Cordillera Central, which must harbour the wintering populations of birds breeding in Cordilleras Central, Guanacaste and Tilarán. A lowland forest area (where the bird occurs during the non-breeding season) close to or continuous with Monteverde Biological Reserve should be identified and become the target of conservation efforts. Population studies are required within all the protected areas mentioned above, but especially in Monteverde, Braulio Carrillo and La Selva (and adjacent areas), to determine whether or not the existing areas contain and protect viable numbers of this species.

The year-round distribution for particular populations needs to be discovered before a more detailed strategy can be designed. An obvious priority is to assess the status of the species in La Amistad (Inter-) National Park and, if found there, to determine the major areas on the Caribbean slope (in Costa Rica and Panama) that the population uses during the non-breeding season. The “relatively inaccessible” areas in Caribbean Panama would appear to be ideal for protection and extension of the Panama part of the national park. The recent observations in the Fortuna area (see Distribution) should be followed up with survey work both there and in the Volcán Baru National Park close by.

**REMARKS** The three nests reportedly found c.1.5-2 m from the ground (Wetmore 1972) appear to be totally (but understandably) dismissed by subsequent authors owing to the fact that no eggs, young or adults were ever recorded at them, and also because the nest of the closely related Amazonian Umbrellabird *Cephalopterus ornatus* has been found 12 m up in a tree.