

This secretive raptor, once widespread on Cuba and still found throughout, has become ever rarer with the loss and disturbance of wooded habitats and particularly in response to human persecution (it specializes on birds and is known to take poultry). Five main population centres are known to remain, three for the nominate race in west and central Cuba, two for the race in the east of the island.

DISTRIBUTION Gundlach's Hawk is endemic to Cuba, where it occurs as two distinct subspecies, the nominate in western and central Cuba and *wileyi* in the east (Wotzkow 1991). The following records are organized by and within provinces from west to east (see Remarks 1), and unless otherwise stated coordinates are taken from OG (1963a):

Pinar del Río Mil Cumbres (22°45'N 83°24'W), currently (Wotzkow 1985); Sierra del Rosario, where it was observed in the 1970s (Reynard *et al.* 1987); Los Palacios (22°35'N 83°15'W; see Remarks 2), May and November 1934 (two specimens in AMNH); Cabañas los Pinos, within La Güira National Park, this being a few km north-west of San Diego de los Baños (22°39'N 83°22'W), where a bird was observed in November 1987 (A. Mitchell *in litt.* 1991); San Cristóbal (22°43'S 83°03'W), February 1944 (Wotzkow 1991); Villa Soroa, north-west of Candelaria (22°44'N 82°58'W), where a bird was observed in February 1989 and another in February 1991 (A. Mitchell *in litt.* 1991);

Habana Cayajabos (22°52'N 82°51'W), undated (Wotzkow 1991); Artemisia, May 1934, January, February and April 1935, 1942, March 1944, December 1949 and February 1950 (specimens in AMNH, ANSP and MCZ; also Wotzkow 1991); Hanábana (*sic*) (Habana), from where the type was described in 1860 (AOU 1983); Cojimar (23°10'N 82°18'W), undated (Barbour 1923); near Tapaste (23°02'N 82°08'W), where a single bird was found during 1985 and 1986 (Wotzkow 1991); Santa Bárbara (c.23°04'N 82°07'W, read from ICGC 1978), March 1985 (Wotzkow 1991);

Matanzas (all from the Península de Zapata) "Ciénaga de Zapata", around 1860, nesting (Gundlach 1893); Santo Tomás (22°24'N 81°25'W), undated (O. H. Garrido *in litt.* 1991); Cárdenas (23°02'N 81°12'W), July 1841 (Lembeye 1850); Soplillar (22°17'N 81°09'W), where six nests were reported between 1981 and 1984 (Wotzkow 1986), and April 1985, when two juveniles were examined (Wotzkow 1991); Laguna del Tesoro (22°21'N 81°07'W), currently (Wotzkow 1985); "Boca de Guamá" (untraced, but about half-way between the resort of Guamá, at the south-eastern corner of Laguna del Tesoro and the Bay of Pigs), where a bird was observed in June 1978 (Clements 1979; also J. F. Clements *in litt.* 1991); "Zapata Swamp", where a nest containing young was found in May 1871 (Wotzkow 1986); La Majagua (22°15'N 81°06'W in García *et al.* 1987), between October 1983 and August 1984 (García *et al.* 1987); Los Sábalos (22°15'N 81°05'W in González *et al.* 1990), January 1988 (González *et al.* 1990); Playa Girón (22°04'N 81°02'W), currently (Wotzkow 1985); Los Avalos (untraced but within the Zapata Swamp), where a nest found in April 1985 contained two chicks (Wotzkow 1986);

Cienfuegos Soledad (22°28'N 80°28'W), undated (Bond 1956b); near Cienfuegos, undated (Bond 1963); Laguna de Guanaroca (22°04'N 80°24'W), in 1962 (García undated) and January 1963 (Wotzkow 1991); between Trinidad (21°48'N 79°59'W) and Casilda (see below), January 1963 (Bond 1963);

Sancti Spíritus Casilda, January 1963 (Wotzkow 1991) and currently (Garrido 1985);

Villa Clara Sierra del Escambray (22°14'N 79°54'W), undated (Reynard *et al.* 1987);

Camagüey Cayo Romano, undated (see Wotzkow Alvarez 1988); Cayo Coco (22°30'N 78°25'W), undated (Regalado Ruíz 1981) and October 1973 (Garrido 1973); near Camagüey (the city), recently (Wotzkow 1991); Loma Hato (21°50'N 77°30'W), Cayo Guajaba, in 1984 (Garrido *et al.* 1986); Nuevitas (21°33'S 77°16'W), August 1987 (Wotzkow 1991);

Granma Bartolomé Masó municipality (20°10'N 76°57'W), sometime between 1980 and 1987 (Torres Leyva *et al.* 1988); Pico Verde, Buey Arriba (20°09'N 76°45'W), where a nest containing three chicks was found in February 1985 (Wotzkow 1986), April 1985 and September 1985 (Wotzkow 1991; also Torres Leyva *et al.* 1988); El Quemado (possibly in the area of Pinar Quemado, c.20°07'N 76°43'W, read from ICGC 1978), between 1980 and 1987 (Torres Leyva *et al.* 1988); Nuevo Yao (c.20°11'N 76°43'W, read from ICGC 1978), between 1980 and 1987 (Torres Leyva *et al.* 1988);

Holguín Yaguabo (20°37'N 76°25'W), río Cauto, March 1972 (Wotzkow 1991); Cacocum municipality (20°44'N 76°23'W), sometime between 1980 and 1987 (Torres Leyva *et al.* 1988); Cupecillo (21°06'N 76°11'W) and Floro Pérez (c.21°01'N 76°14'W read from ICGC 1978), sometime between 1980 and 1987 (Torres Leyva *et al.* 1988); near Gibara (21°07'N 76°08'W), where two specimens were

secured, one from Finca Santa María in 1962, and at río Gibara in 1963 (Bond 1964; also García undated, Wotzkow 1985 and Reynard *et al.* 1987); Gibara (two undated specimens) (Wotzkow 1991); río Corojal (untraced but near Gibara), where a nest was found in June 1987 (Torres Leyva *et al.* 1988); Rafael Freire municipality (21°02'N 76°00'W), sometime between 1980 and 1987 (Torres Leyva *et al.* 1988); Altos del Puio Mayari (*sic*), untraced (but probably near Mayarí); Cayo Saetía (20°47'N 75°45'W), December 1985 (Llanes Sosa *et al.* 1987; also Wotzkow Alvarez 1988) and sometime between 1980 and 1987 (Torres Leyva *et al.* 1988); La Zoilita, El Culebro and El Palenque, currently (these three localities are on the northern slopes of the Sierra del Cristal, 20°33'N 75°31'W) (Abreu *et al.* 1989); La Zoilita, sometime between 1980 and 1987 (Torres Leyva *et al.* 1988), March 1988 (Wotzkow 1991); “Buena Vista” Ranch (untraced), May 1987 (two birds collected) (Wotzkow 1991);

Santiago de Cuba Pico Turquino (19°59'N 76°50'W), Sierra Maestra, currently (O. H. Garrido *in litt.* 1991), this presumably being the same as the less precise site given by Reynard *et al.* (1987); “Santiago de Cuba”, undated (Wotzkow 1991);

Guantánamo “Guantánamo”, February 1889, June 1889 (Wotzkow 1991); Cupeyal (20°35'N 75°11'W), January 1968 (see Wotzkow Alvarez 1988) and from February to March 1985 when a nesting pair was observed (Alayón García 1987); Sierra del Guaso (20°16'N 75°11'W), currently (O. H. Garrido *in litt.* 1991); Las Municiones (La Municipión in ICGC 1978, c.7 km north-east of El Manguito, 20°21'N 75°08'W), where a nest containing four eggs was found in February 1985 (Wotzkow 1986, Torres Leyva *et al.* 1988); 3 km south of La Municipión, March 1985 (Reynard *et al.* 1987); Sierra de Moa, between 1985 and 1987 (Alayón García *et al.* 1987); Cuchillas del Toa Biosphere Reserve (20°27'N 74°58'W), e.g. Ojito de Agua, Calentura, Farallones de Moa, April 1986 (Alayón García *et al.* 1987, Reynard *et al.* 1987, Wotzkow 1991, O. H. Garrido *in litt.* 1991); near Baracoa (20°21'N 74°30'W), currently (Reynard *et al.* 1987);

An untraced locality in Cuba is Júcaro, where several undated observations were made (Lembeye 1850). A record from Cayo Cantiles in the Archipiélago de los Canarreos is now attributed to Cooper's Hawk *Accipiter cooperii*; the fact that the species has not even been recorded on the neighbouring Isle of Pines is another reason for doubting this record (Garrido and Schwartz 1969, Buden and Olson 1989).

POPULATION The evidence is conflicting: Gundlach (1861) reported the species to be “rather rare” but “not very rare in the mountains” (Gundlach 1893) and García (undated) wrote that it was fairly common during the nineteenth century; Phillips (1929) considered to be “well on the road to extinction” and Barbour (1943) regarded it as “one of the rarest hawks in the world”; Brown and Amadon (1968) considered the species to have been “always rare” and perhaps “nearly or quite extinct”; Garrido (1967) judged it to be the rarest of Cuban hawks, yet neither he (Garrido 1985) nor Bond (1968) regarded it as to be in danger of extinction. However, it is now accepted that the species was once much more widely distributed and has disappeared from many places where it was perhaps still present 30 years ago (e.g. Habana province, where it could still be found in the vicinity of Artemisia in the 1930s and 1940s) (Wotzkow 1991, O. H. Garrido *in litt.* 1991). L. Fazio *in litt.* (1992) considered it to be “very rare” in Pinar del Río and Oriente provinces. From the information given by Wotzkow (1985), Torres *et al.* (1988), Abreu *et al.* (1989) and in Distribution, the current population is restricted to the following five areas (the first three holding nominate *gundlachi*, the last two the race *wileyi*): (1) area of Mil Cumbres, Pinar del Río, where three pairs have been estimated; (2) Zapata Swamp, where about 20 pairs are estimated around Playa Girón and Laguna del Tesoro; (3) Sierra del Escambray, Villa Clara (no estimation made); (4) Gibara, south of Holguín (e.g. Cacocum, Yaguabos), Mayarí and Sierra del Cristal (all in Holguín province) and nearby areas in the Sierra del Guasó, Sierra de Moa and Sierra de Toa and Baracoa (Guantánamo province); (5) Granma province, on the northern slopes of Sierra Maestra in the area between Bartolomé Masó, Buey Arriba and El Quemado.

ECOLOGY The secretive Gundlach's Hawk is not considered specialized in its habitat requirements, as it can be found in forest, open woodland, forest borders, swamps, mangroves and mountains below 800 m (Gundlach 1876, Garrido and Schwartz 1969, Garrido 1985, Wiley 1986, Torres Leyva *et al.* 1988, Wotzkow 1991).

It appears to feed exclusively on birds, and among the species known to have fallen its victims are: Northern Bobwhite *Colinus virginianus*, White-crowned Pigeon *Columba leucocephala*, a nighthawk *Chordeiles* sp., doves *Zenaida* spp., Cuban Parrot *Amazona leucocephala*, Red-legged Thrush *Turdus*

plumbeus and Cuban Crow *Corvus nasicus*; females (the larger sex) prefer parrots and pigeons, which are mainly hunted in open areas, while males tend to capture the more abundant and mobile doves and thrushes in forest undergrowth (Wotzkow 1986; also Gundlach 1871-1875, Reynard *et al.* 1987). Gundlach's Hawk has also been observed hunting and chasing domestic hens and pigeons on poultry farms, even entering the installations on foot (Wotzkow 1985; also Gundlach 1876).

Breeding occurs from February to June, but chicks have been found in February (Wotzkow 1986, Torres Leyva *et al.* 1988), suggesting that the breeding season could start as early as January. The nest is built in high trees, including júcaro *Bucida buceras*, pine *Pinus* spp., jubilla *Dipholis jubilla*, soplillo *Lysiloma bahamensis*, ocuje *Calophyllum antillarum* and yaba *Andira jamaicensis*, 7-20 m from the ground and situated close to the main trunk below the canopy (Wotzkow 1986, Torres Leyva *et al.* 1988); however, one has been found in a mangrove (Wotzkow 1991). Clutch-size varies from two to four (Wotzkow 1986).

THREATS Gundlach's Hawk has been reported to be a major predator of poultry (Barbour 1923, Abreu *et al.* 1989; see also Ecology), which, although not well documented, may explain the considerable human persecution it suffers (Wiley 1985a, Reynard *et al.* 1987); in the Cupeyal area, farmers reported shooting three birds late in 1967 (Bond 1968). Habitat loss and human disturbance are also affecting the species's population, as it appears to be very sensitive to environmental changes, which in turn can affect the availability of prey (Wotzkow 1986, 1991). The present lack of fuels in Cuba is causing more woodland to be cut (L. Fazio *in litt.* 1992). Wiley (1986) reported that young birds are being taken for captivity or for the international raptor trade.

MEASURES TAKEN Little is known about the security of the species within protected areas in Cuba. The information under distribution, plus a few comments found in the literature, reveal that some of the protected areas (as listed in Wright 1988) may be of value, namely: Sierra Maestra, Ciénaga de Zapata and Sierra del Cristal National Parks; Cupeyal del Norte and El Sábalo Nature Reserves; Cayo Coco and Cayo Saetía Faunal Refuges, and Baconao, Sierra del Rosario and Cuchillas del Toa Biosphere Reserves.

MEASURES PROPOSED Sierra de Mil Cumbres has been proposed for some form of protection (Wright 1988), which would be likely to benefit the small known population in Pinar del Río. However, the other four main areas for the species, listed at the end of Population, also require careful evaluation, study and management, none of them currently falling within an established protected area. Surveys to identify viable populations in other areas of Cuba are needed, bearing in mind the newly discovered distinctness of birds in eastern Cuba, and detailed studies of the ecology and population dynamics of birds of both races in different habitats would be welcome as a means of increasing confidence in the appropriate measures for the management of the species as a whole; in particular, some illumination of the reasons it is so sensitive to environmental changes when it is so catholic in its choice of habitat would be very valuable. Shooting and trade should be properly penalized (see Wiley 1986).

REMARKS (1) Some localities which were given under old province boundaries have now been included within the present political division of provinces (see ICGC 1978). (2) A. Mitchell (*in litt.* 1992) has pointed out that these specimens may have been collected in the wooded hills of the río Los Palacios nearby San Diego de Los Baños, rather than at Los Palacios (the town), which is surrounded by flat agricultural land and probably was even in 1934.