

Records of this rare woodpecker are confined to primary tracts of Atlantic Forest in southern south-east Brazil, eastern Paraguay and northernmost Argentina, where there have been many records in very recent years. It still, however, requires urgent study and survey using voice playback, to clarify its status and ecological niche.

DISTRIBUTION The Helmeted Woodpecker is endemic to the southern Atlantic (Paranense) Forest region of south-east Brazil, eastern Paraguay and north-east Argentina (Misiones). In the following account, records are listed from north to south with coordinates taken, unless otherwise stated, from Paynter (1985, 1989) and Paynter and Traylor (1991).

Brazil The species is known from São Paulo, Paraná, Santa Catarina and at least formerly Rio Grande do Sul, but it is noteworthy that it has been recorded from two and possibly all three frontier areas of southernmost Mato Grosso do Sul (Porto Camargo in easternmost Paraná, Capitán Bado in westernmost Concepción, Paraguay, and possibly the Sierra de Maracaju, northernmost Canindeyú, Paraguay), indicating that it might yet be (or once have been) found in the state.

São Paulo Records are from: Rio Feio, 21°26'S 50°59'W, 1901 (Pinto 1938); Ribeirão Caingang ("Ribeirão dos Bugres"), 21°40'S 51°32'W, April 1901 (Pinto 1938); Vitoriana ("Victoria"), April 1902 (specimen in AMNH); "Aracuahy" mountain near Ipanema, April, May, June and December in the years 1819-1822 (von Pelzeln 1868-1871); Rio Carmo road, Fazenda Intervales, 850 m, 24°17'S 48°25'W, near Capão Bonito, February 1987 (Willis 1987); Iguape, October 1901 (Pinto 1938), this presumably the locality specified as Baurú in von Ihering and von Ihering (1907); Carlos Botelho State Park, 900 m, November 1988 (C. Yamashita *in litt.* 1988); Ilha do Cardoso State Park, recently (P. Martuscelli *in litt.* 1991).

Paraná Records are from: Jacarezinho, March and April 1901 (Pinto 1938; specimens in MZUSP), this being present-day Ourinho (see Distribution: Paraná under Golden-capped Parakeet *Aratinga auricapilla*); Porto Camargo, January 1954 (Pinto and de Camargo 1955; hence King 1978-1979, Sick 1985); Cândido de Abreu, November 1929 (specimen in FMNH); Castro, June 1914 (Pinto 1938); Iguaçu National Park on the Poço Preto trail, October 1988 (TAP, O. Læssøe *in litt.* 1989), November 1988 (P. K. Donahue *in litt.* 1989), May 1989 (M. Pearman *in litt.* 1990) and August and November 1990 (M. Castelino and D. Finch *per* J. C. Chebez *in litt.* 1992).

Santa Catarina Records are from: Canoinhas ("Ouro Verde"), 26°10'S 50°24'W, Serra do Lucindo, 750 m, May 1929 (specimen in AMNH); Poço Preto, 750 m, April 1929 (specimen in AMNH); Joinville, specimen (in BMNH) received in January 1890; Trombudo Alto (untraced, but perhaps near Trombudo Central; the rio Trombudo is an affluent of the Itajaí d'Oeste: J. F. Pacheco *in litt.* 1992), 1946 (Sick 1985).

Rio Grande do Sul Records are from: São Pedro (de Alcântara) at the coastal lagoons, October 1928 (specimen in AMNH); Poço das Antas (Gliesch 1930), presumably around 1920 (Belton 1984-1985); Taquara, August 1883 (von Berlepsch and von Ihering 1885). The species is presumed extinct in the state, but a record inside Argentina (see below), just north across the frontier from the Turvo Forest Reserve (for which see Albuquerque 1977) near the Santa Catarina border, indicates its possible survival in the area (Belton 1984-1985).

Paraguay The species has been recorded from a wide area of the eastern half of the country.

Amambay Single specimens are from Cerro Amambay, near Capitán Bado, August 1938, and from 47 km south-west of Cerro Amambay, October 1938 (Storer 1989b).

Canindeyú Records are from north of Curuguaty: 13 km, specimen, July 1979 (Storer 1989b); 10 km, sighting, 15 September 1989, and 7 km, probable sighting, next day (P. A. Scharf and F. E. Hayes *in litt.* 1991). There was another probable sighting at Estancia La Fortuna near Mbaracayú (Maracaju), June 1991 (R. S. Ridgely *in litt.* 1991; treated as a certain record in *Winging It* 4,4 [1992]: 53).

Caaguazú A specimen was collected at "Piccada de Aios" (= modern-day Coronel Oviedo: Paynter 1989) between the end of June and mid-August 1893 (Salvadori 1895b).

Alto Paraná The species has been recorded recently from the Itaipu area, i.e. near the dam (N. Pérez and A. Colman *in litt.* 1988), and within this general region one was seen 20 km north of Hernandarias in July 1982 (M. Nores and D. Yzurieta *in litt.* 1986) and a pair was seen in or near the Itabo

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Forest Reserve in June 1991 (R. S. Ridgely *in litt.* 1991). The undated record from Puerto Bertoni, 25°38'S 54°40'W (Bertoni 1939), is presumably that mentioned as from 25°43'S by Bertoni (1901).

Paraguay Three birds were collected at Sapucaí, 25°40'S 56°55'W, in July and August 1904 (Chubb 1910; specimens in BMNH, MACN).

Itapúa A specimen (in MNHN) was collected in July 1948 at Puerto Edelira, which is on the río Paraná north of Capitán Meza (J. C. Chebez *in litt.* 1992), Capitán Meza being at 27°01'S 55°34'W (Paynter 1989).

Argentina Records are all from Misiones province, as follows:

Puerto Aguirre (now part of Puerto Iguazú), 25°36'S 54°35'W, July 1920 (specimen in MCZ); "Iguazú", October 1900 (specimen in MACN); Iguazú National Park (and possibly environs), e.g. immature seen on the Bernabé Méndez trail, May 1989, and a female seen 500 m from the El Timbo ranger post also near the Bernabé Méndez trail, July 1991 (M. Pearman *in litt.* 1990, 1991), with a further 14 records from 1900 (one), 1985 (two), 1988 (two), 1990 (four) and 1991 (five) compiled and to be published by J. C. Chebez (*in litt.* 1992); Sierra Morena, untraced but in Iguazú department (*per* J. C. Chebez *in litt.* 1992); arroyo Urugua-í, 25°54'S 54°36'W, km 10, March 1958 (two specimens in AMNH), km 30, August 1954 and October 1957 (specimens in AMNH, MACN); near Almirante Brown (Comandante Andresito), untraced but in General Belgrano department, 1989 (*per* J. C. Chebez *in litt.* 1992); Araucaria Provincial Park, San Pedro department, 1989 (*per* J. C. Chebez *in litt.* 1992); arroyo Yabotí-miní, 30 km north of its estuary, at 26°57'S 53°51'W, San Pedro department, close to the Turvo reserve in Brazil, February 1991 (J. Baldo *per* J. C. Chebez and M. Nores *in litt.* 1992, whence also coordinates); San Vicente, untraced but in Guaraní department, 1988 (*per* J. C. Chebez *in litt.* 1992); Lanusse (Colonia Gobernador J. J. Lanusse), 26°00'S 54°17'W, 1979 (C. C. Olrog *per* M. Nores and D. Yzurieta *in litt.* 1986), this probably the same as the record in Lucero and Alabarce (1980); Puerto Rico, untraced but in Libertador General San Martín department, 1988 (*per* J. C. Chebez *in litt.* 1992); Colonia Victoria, untraced but (according to Paynter 1985) probably near Eldorado at 26°24'S 54°38'W, August 1969 (specimen in LSMZ); Eldorado itself, 1925 (*per* J. C. Chebez *in litt.* 1992); arroyo Piray-miní, near the confluence of arroyo Coral, untraced but in Eldorado department, 1991 (*per* J. C. Chebez *in litt.* 1992); Tobunas, 26°28'S 53°54'W, October 1953 and July 1959 (seven specimens in FMNH, LACM, MACN); Dos de Mayo, 27°02'S 54°39'W, 1979 (C. C. Olrog *per* M. Nores and D. Yzurieta *in litt.* 1986); San Ignacio, January 1942 (Anon. 1942); arroyo Anselmo and Puerto San Juan, both untraced but in Candelaria department and both south of San Ignacio, 1988 and 1991 respectively (*per* J. C. Chebez *in litt.* 1992); Campo San Juan, near San Ignacio, January 1992 (J. Baldo *per* M. Nores *in litt.* 1992); Bonpland (= Bonplano), 27°29'S 55°29'W, 1915 (*per* J. C. Chebez *in litt.* 1992). The record above that corresponds to the one reported by C. C. Olrog (in Belton 1984-1985) as being due north of Rio Grande do Sul's Turvo Forest Reserve appears to be Dos de Mayo, Chebez (1986) indicating that the area in question was at the junction of Guaraní and San Pedro departments; but as indicated above the recent record from arroyo Yabotí-miní was also very close to Turvo.

POPULATION The chronic and common opinion is that the Helmeted Woodpecker is a rare or very rare species (von Berlepsch and von Ihering 1885, Salvadori 1895b, von Ihering 1898, Chubb 1910, Short 1982, Sick 1985, Canevari *et al.* 1991; also D. F. Stotz *in litt.* 1988, F. E. Hayes *in litt.* 1991). However, the speculation that it might even be extinct (Short 1982) has been followed by the expectation (bolstered by the many previously unpublished records above) that it might not prove so very rare as feared (M. Nores and D. Yzurieta *in litt.* 1986, R. S. Ridgely *in litt.* 1991, J. C. Chebez *in litt.* 1992), although caution has been urged in the field identification of the species (B. M. Whitney *in litt.* 1991; see Remarks). The population in the adjacent Iguacu and Iguazú National Parks in Brazil and Argentina seems likely to be the largest and safest, yet the general failure of birds to respond to tape playback in the former, over many kilometres of track, suggests a genuine rarity even there (TAP); however, it may prove not to be so rare in the Serra de Paranapiacaba (C. Yamashita *in litt.* 1988). Numbers on Ilha do Cardoso appear very small but stable (P. Martuscelli *in litt.* 1991).

ECOLOGY Very little is known. The bird dwells in forest in valleys and on mountains (Sick 1985), and was found in misty cloud-forest at Intervalles (Willis 1987) and Carlos Botelho State Park (C. Yamashita *in*

litt. 1988). It climbs trunks and central branches of trees, preferably at middle height (Canevari *et al.* 1991): a bird in Iguazú National Park, July 1991, was foraging on large trunks, 4-7 m up, in heavy primary forest (M. Pearman *in litt.* 1991), another in the Sierra Morena was foraging at mid-height on a laurel negro *Nectandra saligna* (J. C. Chebez *in litt.* 1992), and a third in Iguazu foraged in low-lying forest (understorey dominated by bamboo) c.8-9 m above the ground on trunks of medium-sized trees c.25 m tall, pecking and probing in loose bark covered with mosses and lichens (TAP). This use of the middle storey appears to separate the species from the Lineated Woodpecker *Dryocopus lineatus* and Robust Woodpecker *Campephilus robustus*, which tend to haunt the upper storey (J. C. Chebez *in litt.* 1992), although it has been postulated that the species is a mimic of the latter (Willis 1989). Despite the presence of forest up to 900 m on Ilha do Cardoso (the highest point on the island), the species seems to be restricted to forest at 40-200 m (P. Martuscelli *in litt.* 1991), although it has been recorded in Santa Catarina at 750 m (see Distribution). Many of the recent records from Argentina have been from very modified areas, three of them adjacent to towns, but the species still appears to need patches of pristine forest or at least logged forest which still retains some characteristics of pristine forest (J. C. Chebez *in litt.* 1992).

The diet remains unreported. Because moult is from April to July, the breeding season was anticipated to fall between November and February (Short 1982). In fact, the only confirmed breeding record stems from late September and early October 1985, when a nest was found 2.3 m (presumably; “2.30 cm” in original) up in an unidentified tree at the arroyo Ñandú camp-site in Iguazú National Park (Chebez 1986b). A bird was at an apparent nest-hole in a tree by the side of the road in Iguazu National Park, November 1988 (P. K. Donahue *in litt.* 1989), and on the same road in August 1990 a pair were behaving very territorially (M. Castelino *per* J. C. Chebez *in litt.* 1992). The record from San Ignacio, January, was of a juvenile male (Anon. 1942).

THREATS The rarity of this species is likely in part to be natural, and may be owing to a particular habitat specialization such as an association with a certain bamboo (B. M. Whitney *in litt.* 1991). It has certainly been observed that it seems to require large tracts of forest, and of course must therefore have suffered from their constant diminution and fragmentation (F. E. Hayes *in litt.* 1991); yet against this are recent observations from Misiones, Argentina, of birds in fairly small and sometimes much disturbed forested areas, suggesting that habitat loss may not be so serious a threat as might be expected. In eastern Paraguay some of the bird's range around the Itaipu Dam was being permanently inundated (N. Pérez and A. Colman *in litt.* 1988), and the areas along the Urugua-í in Argentina have suffered the same fate (J. C. Chebez *in litt.* 1992). The one nest ever recorded apparently failed because, by some extraordinary quirk, the tree was cut down (P. Canevari *in litt.* 1987).

MEASURES TAKEN The Helmeted Woodpecker is protected under Brazilian law (Bernardes *et al.* 1990), and has been recorded from Carlos Botelho State Park, Ilha do Cardoso State Park and Iguazu National Park in Brazil, the Itabo Reserve in Paraguay, and Iguazú National Park and Araucaria Provincial Park in Argentina, where it probably also occurs in Urugua-í and Moconá Provincial Parks (J. C. Chebez *in litt.* 1992).

MEASURES PROPOSED Taped voice playback, used sensitively, offers perhaps the most efficient method of determining the presence or absence of the species in particular areas, and any general avifaunal surveys anywhere in the range could include this low-key component. Work is also needed to gather as much as possible on its ecology and needs, so that management can be contemplated; such studies could perhaps best be undertaken in either Iguazu or Iguazú National Parks, or even both. A survey is needed of Turvo Forest Reserve in Rio Grande do Sul, and at some stage an investigation of the southernmost area of Mato Grosso do Sul south of 22°S might be appropriate. In eastern Paraguay the status of the bird north of Curuguaty and in the Itaipu Dam region requires elucidation. In Argentina the species occurs in four areas that are proposed for protection, namely Yabotí, Puerto San Juan, Piray-miní and Sierra Morena (J. C. Chebez *in litt.* 1992).

REMARKS B. M. Whitney (*in litt.* 1991) pointed out that some recent field observations (not necessarily in this account, as there appear to have been several more from Iguazú National Park) may possibly have involved Lineated Woodpeckers, which in that region have much rusty colour in their underparts not

mentioned or depicted in field guides, and he urged all observers to provide full descriptions. However, C. Yamashita (*in litt.* 1988) considered the opposite may also sometimes happen, with Helmeted Woodpeckers being identified as Lineated, and going under-recorded as a result. J. C. Chebez (*in litt.* 1992), aware of these concerns, has reaffirmed his confidence in the veracity of the records he supplied for this account.

The species appears to be morphologically and behaviourally intermediate between *Celeus* and *Dryocopus* woodpeckers: the small pale bill, manner of foraging, and drum pattern are all rather *Celeus*-like, whereas the plumage pattern is certainly like *D. lineatus*, while the strident 4-5 note song is intermediate, having the loudness and pattern of a *Dryocopus* but the emphatic quality of several *Celeus* species (TAP).