

*Discovered in dry north-westernmost Peru in 1876 and generally presumed extinct for a century thereafter, this guan is now known from a small number of dry wooded valleys in the Andean foothills of Peru (chiefly in Lambayeque), where it numbers possibly less than a hundred individuals and is seriously endangered by forest clearance.*

**DISTRIBUTION** The White-winged Guan is restricted to a small area of north-west Peru, although the exact extent of its distribution there remains to be clarified; that it might or does occur in adjacent Ecuador is dealt with in the last paragraph in this section.

The species was originally described from a specimen collected in December 1876 on Condesa island, 3°31'S 80°29'W, in the Santa Lucia swamps of the Tumbes river delta, Tumbes, and a second specimen was obtained a month later, January 1877, at the Hacienda Pabur, 5°15'S 80°20'W, 200 km to the south and 130 km inland, in Piura, while a third specimen from the same locality is believed to be the live-caught offspring of the second (Taczanowski 1877, 1884-1886, Vaurie 1966b, de Macedo 1978, 1979). At the time of its first discovery, the species was reported at second-hand to inhabit mangroves at the mouth of the Zarumilla ("Zurumilla") on the border with Ecuador, and to be found in all the larger river valleys of western Peru as far south as the Chicama in La Libertad (but there was no sight record from there, *contra* Meyer de Schauensee 1966), in particular those at Lambayeque and "Nancho (Rio de Saña)" in adjacent Cajamarca (Taczanowski 1884-1886).

A century later, in September 1977, the general veracity of these reports was established with the rediscovery and collection of one specimen of the species in Quebrada San Isidro, 5°35'S 79°48'W, on the Hacienda Querpón, Querpón, some 40 km south of Hacienda Pabur (de Macedo 1978, 1979), and the subsequent rapid discovery of c.25 other localities, of which 17 or more were suspected to hold breeding pairs (Ortiz 1980). All these recently discovered sites lie within Lambayeque department (although some were erroneously referred to Piura by de Macedo 1978 and Dejonghe and Mallet 1978) from 5°31'S, near the border of Piura department, to 6°22'S, east of Chiclayo, localities being: near Hacienda Chiernique, 5°34'S 79°55'W, at Jaguay Grande (only visiting birds July-December), Chacra de Paulino (vagrants) and Quebrada de Vacas (2-3 pairs); Quebrada de Querpón, 5°37'S 79°49'W, at Olla Serrana (one pair), San Isidro (three pairs), El Guabo (vagrants) and El Chirimoyo (vagrant); Hacienda Boca Chica, 5°42'S 79°48'W, at Quebrada de Pavas (3-4 pairs) and Quebrada Mugo Mugo (vagrants, perhaps 1-2 pairs); El Tocto, 5°47'S 79°41-42'W, at Quebrada La Pachinga (2-3 pairs), Quebrada Paltorán (vagrants, perhaps 1-2 pairs: this valley in conjunction with the former is where the guan occurs highest, at times up to 1,200 m), Quebrada Cachaco-Quebrada Rosas (one pair), Quebrada Caballito (one pair; but see Population), Quebrada Granada (one pair), Quebrada Peña Blanca (one pair), a second Quebrada Paltorán (two pairs, possibly the same as those in Quebrada Granada and Quebrada Pomapara) and Quebrada Pomapara (one pair); Hacienda Recalí, 5°51-52'S 79°41'W, at Quebrada El Algodonal-Oberito (one pair), Quebrada Oberito (3-4 pairs), Quebrada Las Torcazas (perhaps one pair) and Quebrada El Barranco (vagrants) (Ortiz 1980); río Olmos, 5°54'S 79°35-36'W, at Quebrada Oberal, Quebrada Naranja and Quebrada Agua Blanca (E. G. Ortiz *in litt.* 1988); Lajas, 6°21'S 79°29'W, at Quebrada Negrohuasi (1-2 or more pairs) and El Reloj (one pair) (Ortiz 1980); and near Chongoyape, east of Chiclayo, at 6°39'S 79°24'W (Eley 1982). Details of most of these localities are given by Ortiz (1980).

Dozens of valleys in this area were found not to hold guans (Ortiz 1980), and although Ortiz (1980) claimed that more could possibly be found, it seems unlikely that there would be many in view of the areas covered (NK, E. G. Ortiz *in litt.* 1988). A nest was found 27 May 1978 in the vicinity of El Cabuyo in Quebrada de Pavas, at 5°40'S 79°45'30"W (Ortiz 1980, Williams 1980). More birds can probably be found both within and outside the currently known range (Ortiz 1980). The Andean foothills to the north of Hacienda Pabur – notably the Cerros de Amotape National Park in Piura – may also hold the species (Delacour and Amadon 1973, King 1978-1979), and the islands of the Tumbes delta certainly appear to hold vegetation similar to that in which the species now occurs (de Macedo 1978, 1979). In 1988 soldiers and cattle herders in Bosque Nacional de Tumbes reported the presence of a large black guan in evergreen forest along the Ecuadorian border; several informants were certain that the birds had white flight-feathers as in the present species, but their memory might have been influenced by a poster of it on display at the military post, leaving a chance that the species was actually Crested Guan *Penelope purpurascens*, which is known from west Ecuador within 25 km of the Peruvian border (Parker *et al.* 1989).

That the species might be found in the large, little disturbed swampy region of coastal Ecuador anywhere south of Guayaquil (Delacour and Amadon 1973) was almost borne out in August 1980 when White-tailed Jays *Cyanocorax mystacalis* were heard giving imitations of guan alarm calls in a fairly undisturbed *Ceiba*-dominated forest east of Arenillas in coastal El Oro; although the birds being imitated might have been Crested Guans, which occur as close as El Chiral, the latter (in Ecuador at least) normally occupy humid forest, and the suspicion remains that The White-winged Guan was (or had recently been) present (R. S. Ridgely *in litt.* 1992; see Remarks 1).

**POPULATION** By report the species was common and found close to the town of Tumbes up to around 1850, but by the late 1870s it had become “everywhere rare” (Taczanowski 1884-1886). The report that it was “close to complete extermination”, with a guessed-at 15 pairs remaining on Condesa, the last remaining site for the species in Tumbes (Taczanowski 1884-1886), was clearly responsible for the uncritical assumption of extinction that followed (Vaurie 1966b, 1968, Blake 1977). On being rediscovered, the total population was estimated to be a few hundred birds at most (de Macedo 1978). E. G. Ortiz (1980, *in litt.* 1987) showed the existence of 54-68 or more birds in Lambayeque in 1978 (these are detailed by site in Distribution), and stated that more birds could probably be found within this region, but he and J. P. O'Neill speculated the total population to number fewer than 100 birds (Eley 1982), and according to local residents the population has declined in recent years, notably after the land reforms of 1968, which gave public access to much land previously belonging to large haciendas (Ortiz 1980). At an unspecified date presumably in the late 1980s further surveys resulted in observations of under 200 birds and an estimate of only a few hundred in total (Díaz Montes 1991).

Populations at individual sites presumably vary, depending on patterns of local movement and breeding success; thus for example Ortiz (1980) reported one pair resident in Quebrada Caballito, M. Kessler (*in litt.* 1988) reported two groups (one of three birds) in February 1986, five were there in June 1987 (M. Pearman *in litt.* 1989), and an estimated 12 (six seen together) in August 1989 (B. M. Whitney *in litt.* 1991); see Remarks 2.

**ECOLOGY** The White-winged Guan inhabits dry wooded slopes and ravines in the deep valleys of the western Andean foothills from about 300 to 900 m, rarely up to 1,200 m, but may well also have occurred in coastal gallery forests (Ortiz 1980, Eley 1982; also de Macedo 1979). That its long tarsus implies adaptation to stream-side and mangrove habitats (Vaurie 1968) is, however, an error of tarsus-length assessment (Delacour and Amadon 1973). On Condesa, an island densely fringed with mangrove, the habitat consists of trees characteristic of dry north Peruvian forests, notably mesquite *Prosopis chilensis*, wattle *Acacia macracantha* and the groundsels *Baccharis lanceolata* and *B. salicifolia*; the guans would pass the day in impenetrable thickets and only leave at dawn and dusk to forage amongst the mesquite, whose pods appeared to supplement a staple early-year diet of buckthorn *Scutia spicata* berries (Taczanowski 1884-1886, de Macedo 1978, 1979). In Lambayeque it typically inhabits forested slopes in valleys with small permanent streams (valleys without constant presence of water being frequented only temporarily) and dry deciduous forest with safe (70%) cover, food plants and little human disturbance (Ortiz 1980). Characteristic plants (in order of predominance) are: in the valley bottoms the trees *Ficus* sp. (in the humid parts near the streams), “chamelico” (unidentified), *Ceiba trichistandra*, *Acacia macracantha*, *Pithecellobium multiflorum* and “cerezo” (unidentified), the bushes *Encelia* sp., *Cestrum* sp. and “santa maría” (unidentified), and in muddy places with abundant water also the grass *Gynerium sagittatum*; on the slopes the trees *C. trichistandra*, *Loxopterygium huasango*, *Cordia rotundifolia*, *Erythrina* sp., *Bursera graveolens* and *Genipa americana*, and the bushes *Encelia* sp., *Grabowskia boerhaaviaefolia*, *Oenothera verrucosa*, “solumpe” (unidentified) and *Croton* sp.; and for the upper reaches of the valley the trees *L. huasango*, *C. trichistandra*, *Erythrina* sp., *B. graveolens* and *G. americana*, the bushes “solumpe”, *Croton* sp. and *G. boerhaaviaefolia*, also many cacti *Cereus* sp., and in the rocky parts an abundance of *Puya* sp. (Ortiz 1980). A list of 105 species of plants from its habitat is presented by Ortiz (1980). It is usually found in pairs or small family groups, but during the non-breeding season as many as 10 may be seen together (Ortiz 1980). It is territorial, especially during the breeding season, and is most active early in the morning and late in the day (Ortiz 1980). Activity starts at 05h45 when it leaves its perch, typically a well-hidden branch c.3 m above the ground, and performs short, vertical, ascending flights with noisy, powerful wingbeats, a behaviour typical of many species of guans (Ortiz 1980). Following the morning display, it descends to the valley bottom to drink and eat until

07h30-08h00 (sometimes to as late as 10h00), and then finds a cool, shady place where it will eat and rest without much movement till 16h30 or 17h00, when it again becomes active till 18h45, whereafter it finds a place to roost, often different from that used the previous night (Ortiz 1980). During the dry season some guans, mainly younger birds, travel to other valleys in search of food, water and breeding sites (Ortiz 1980). Within the valleys the guans are mainly found in the most humid parts, especially during the dry season, when these areas are confined to the higher parts of the valleys, but if undisturbed they will descend in the morning to places with greater abundance of water at lower elevations (Ortiz 1980). Flights in the open are avoided if possible, but occasionally as much as 200 m may be covered in a single glide (Ortiz 1980). B. M. Whitney (*in litt.* 1991) noted that birds in August kept to moist ravines through the heat of the day, but moved around in trees devoid of leaves on dry slopes early and late in the day, and when flying across a quebrada made no noise whatsoever.

The diet consists of fruits, flowers, leaves, buds and seeds, and possibly a few insects, though the latter needs confirmation (Ortiz 1980). Fig trees *Ficus* sp., whose fruits are among the most favoured, grow in humid places at low elevations and are frequented when the fruits are ripe (March-July and October-December) (Ortiz 1980). Other fruits include the fleshy berries of *Celtis iguanea* (May-July and October) and the unidentified “naranjillo” (June), the drupes of *Geoffroea striata* (July-September), and the fairly dry pods of *Pithecellobium multiflorum* (May-October), *Prosopis* sp. (February-April), *Acacia macracantha* (February-March, June-July and September) and *Caesalpinia corymbosa* (April, June-July and September); of flowers only the petals are devoured in the case of *Erythrina* sp. (February-April and August-November), while the whole flower is eaten from the unidentified “cerezo” (March-May and July-August); flowers of *Encelia* sp., abundant on the slopes March-May, are much sought after by the guans, who also eat the thin leaves and buds; buds are also taken from *Alternanthera* sp. (March-April), and in January fruits, leaves and buds may be taken from the unidentified “hoja tiesa”; seeds are principally extracted from the fruits of “*Bombax discolor*” (= *Ceiba trichistandra*) (June-August) and the unidentified leguminacean “chaquiro” (throughout the year); occasionally guans will visit fields in April, where they may eat shoots of maize, sweet potatoes and beans; only in Quebrada Cachaco or Quebrada Paltorán (which of the two was unspecified) in the El Tocto area are they known to eat coffee fruits (June-July) (Ortiz 1980, where details of 43 different food plants are given).

During the breeding season the loud calls, which are most often given between 06h00 and 06h45 and which can be heard over 1 km away, can be used to establish the presence or absence of guans in an area (Ortiz 1980). The only confirmed nest of the species was found in late May 1978, 2.5 m up in a small, heavily leaning vine-covered tree in dense forest at 470 m on steep slopes near a stream; it held three infertile eggs (Williams 1980). However, breeding is also confirmed at sea level in December-January, since the female collected in January 1877 had charge of two two-day-old chicks (Taczanowski 1884-1886), although the nearby thick untidy nest of dry branches 3 m off the ground could have been of another species, e.g. a heron (Williams 1980).

**THREATS** Hunting was identified as the sole cause of the species's disappearance from around Tumbes, c.1850-1877, and birds were then described as very timid (Taczanowski 1884-1886); indeed their current restriction (apparently) to the Andean foothills is probably attributable to hunting pressure along the coast (Eley 1982). However, in these foothills it is in serious danger of extinction owing to habitat destruction, with trees being felled for charcoal or wood to use in fruit-boxes and parquet (de Macedo 1978, 1979). Hunting of the guan continues in these foothills, mainly in Quebrada Mugo Mugo where many people have firearms, but in most of the remainder of the guan's range firearms are scarce and ammunition too expensive for the residents to use on an animal of only 1.5 kg (Ortiz 1980). Slings are sometimes used, and in Quebrada Negrohuasi four guans were killed with slings in early 1978 (Ortiz 1980). Hunting pressure increased after land reform in 1968, before which time the areas were privately owned and had little public access (Ortiz 1980). Nevertheless, habitat destruction is by far the greatest threat, as there is an ever-increasing pressure by man looking for wood, water and new areas to cultivate (Ortiz 1980). Recent studies have indicated that “chronic extreme drought, the unstable nature of the north-east dry forests and other factors such as infertility still limit the population size” (Díaz Montes 1991).

*Natural predators* Local people reported that the Black-chested Buzzard-eagle *Geranoaetus melanoleucus* is the principal predator of the guan in some areas, and they knew of at least two cases where guans had been killed by this hawk (Ortiz 1980). A guan of which the several-months-old, eaten remains were found in Quebrada San Isidro may also have died this way (Ortiz 1980). A Solitary Eagle

*Harpyhaliaetus solitarius* was seen making an unsuccessful pass at a guan in Quebrada San Isidro on 13 June 1978 (Schulenberg and Parker 1983). Also Bay-winged Hawk *Parabuteo unicinctus*, known to have killed guans in other areas (Brown and Amadon 1968), occurs within the range of The White-winged Guan (Ortiz 1980). The mustelid *Eira barbara*, also occurring here, can take guans, though this is not common (Ortiz 1980). A number of predators probably take eggs or chicks of the guan, but there is no specific information on this (Ortiz 1980).

**MEASURES TAKEN** Within two months of the species's rediscovery in September 1977 the then Rare Animal Relief Effort (now RARE) gave US\$3,000 to provide interim protection for the species at Quebrada San Isidro, organized by G. del Solar (unattributed paper on ICBP's files). RARE and WCI have continued to fund research and conservation of the species (Díaz Montes 1991). The species and its habitat is now completely protected by law (it is also covered by the U.S. Endangered Species Act: Nowak 1990), and a reserve at Quebrada Negrohuasi has been established; this protection, however, only exists on paper and has had little real effect (Ortiz 1988). The Cerro de Amotape National Park (91,300 ha: IUCN 1992) in Piura may hold the species (King 1978-1979).

*Captive breeding* A breeding programme of captive birds is being carried out on G. de Solar's fruit farm near Olmos (Ortiz 1988). In August 1989 around 24 birds were held at the establishment (B. M. Whitney *in litt.* 1991). In November 1990 APECO and Stichting Crax formally agreed to start a breeding centre with the support of G. de Solar, using the 23 captive birds (four reproductive pairs) and with the long-term aim of reintroduction into natural habitats (Díaz Montes 1991).

**MEASURES PROPOSED** A "national sanctuary" for The White-winged Guan has been proposed (Díaz Montes 1991), although whether as a general concept or as a decided area is unclear; certainly, however, such a reserve is highly desirable, and would also benefit at least two other threatened species, namely Grey-headed Antbird *Myrmeciza griseiceps* and Henna-hooded Foliage-gleaner *Hylocryptus erythrocephalus*, as well as a very large number of Tumbesian dry forest and scrub endemics (see ICBP 1992, Crosby *et al.* in prep.; also Cracraft 1985 for partial list). Meanwhile, a concerted, systematic effort to discover more sites holding The White-winged Guan is required: this should involve the identification (by aerial photographs or satellite imagery) and investigation of all suitable dry forest areas in Tumbes, Piura, Lambayeque and even La Libertad; surveys of any habitat at the mouth of the Zarumilla on the Ecuador border; and a re-survey of Condesa and other islands in the Tumbes delta. In Ecuador the species merits searching for in any dry forests associated with coastal mangrove habitat bordering the Golfo de Guayaquil (see also Remarks 1). Additional data on the conservation of dry/moist forest birds in western Ecuador and north-west Peru are in the equivalent section under Grey-backed Hawk *Leucopternis occidentalis*.

**REMARKS** (1) R. S. Ridgely (*in litt.* 1992) added that there have been no subsequent records of guans from the region, including the large tract of forest controlled by the military between Arenillas and Huaquillas; these are surely worth investigation. (2) The fact that a high count was achieved at the height of the dry season, when birds were concentrated in evergreen thickets (B. M. Whitney *in litt.* 1992), may indicate that other seasons produce inaccurately low census figures owing to the lower detectability of the species.