

Avifauna of the sector El Caucho – Cotrina, Cerros de Amotape National Park, north-western Peru: chronology of recent discoveries, assessment of endemism, abundance, breeding and seasonality

Tino Mischler

Avifauna des Sektors El Caucho – Cotrina, Nationalpark Cerros de Amotape, Nordwest-Peru: Chronologie der jüngsten Artnachweise, Evaluierung von Endemismus, Abundanz, Jahresphänologie und Brutstatus

Am 11. Juli 2006 wurde die Reservatszone Tumbes (ZRT), an der Grenze zu Ecuador, im äußersten Nordwesten Perus gelegen, zum Nationalpark erklärt. Dieser Beitrag stellt die aktualisierte und kommentierte Checkliste der Vögel aus Literatur- und eigenen Felddaten zusammen. Er zeigt die Chronologie der dortigen Neuentdeckungen für Peru. Feldbiologische Daten werden für einige seltene und bislang übersehene Arten geliefert. Zum ersten Mal werden Höhenpräferenzen, Abundanzen und jahreszeitliches Auftreten aller Vögel eingeschätzt. Die Analyse deckt auf, dass die ZRT 1) die zweithöchste Artenzahl (53) an endemischen Vogelarten weltweit besitzt, für eine Einzellokalität wahrscheinlich die höchste, 2) die höchste Biodiversität an Vogelarten (254) westlich der peruanischen Andenwasserscheide hat, 3) der Ort mit der höchsten Zahl neuer Landesnachweise (26) für Peru der letzten 30 Jahre ist. Die Arten bevorzugen die niedrigere Höhenstufe, den tumbesischen Trockenwald, geringfügig stärker als die höhere Zone, den halbimmergrünen tropischen Pazifikwald. 150 (60 %) aller Arten werden als rar eingestuft. 82 % aller 65 tumbesischen Endemiten finden sich hier. Brutnachweise sind bisher erst für 33 Arten (13 %) erbracht.

Key words: avifauna, endemism, abundance, breeding status, seasonality, Pacific forest, Tumbes

Tino Mischler, Hostería Sommergarten, Chimborazo #248 y Riofrío, Sangolquí, Ecuador
E-Mail: tino.mischler@gmx.de

Introduction

North-western Peru holds a biogeographical region completely different from the rest of the country: the Tumbesian Endemic Bird Area (EBA 045 in Stattersfield et al. 1998). The department of Tumbes lies in the middle of this biome consisting mainly of dry deciduous forest. In its eastern corner, bordered in the south by the Río Tumbes, in the east by Ecuador, in the west by Pampas de Hospital and in the north by Matapalo and desert-like scrub, 751 km² were set aside on 28 September 1994 as the Reserved Zone of Tumbes (Zona Reservada de Tumbes, Fig. 1, from hereon: ZRT). On 11 July 2006 this

zone obtained National Park status, as an extension of the Cerros de Amotape National Park, leaving out a small strip on its south-eastern-most corner towards the Río Tumbes that was instead declared the National Reserve of Tumbes with use for cattle herding (Fig. 1). Some ornithological fieldwork has been carried out in the sector from El Caucho to Cotrina in the area of the former ZRT (Best & Kessler 1995, Parker et al. 1995, Wiedenfeld et al. 1985). Keeping in mind that all these studies were conducted before the area's upgrade in conservation status, I will refer to this particular area as the ZRT despite its recent inclusion into the adjacent national park.

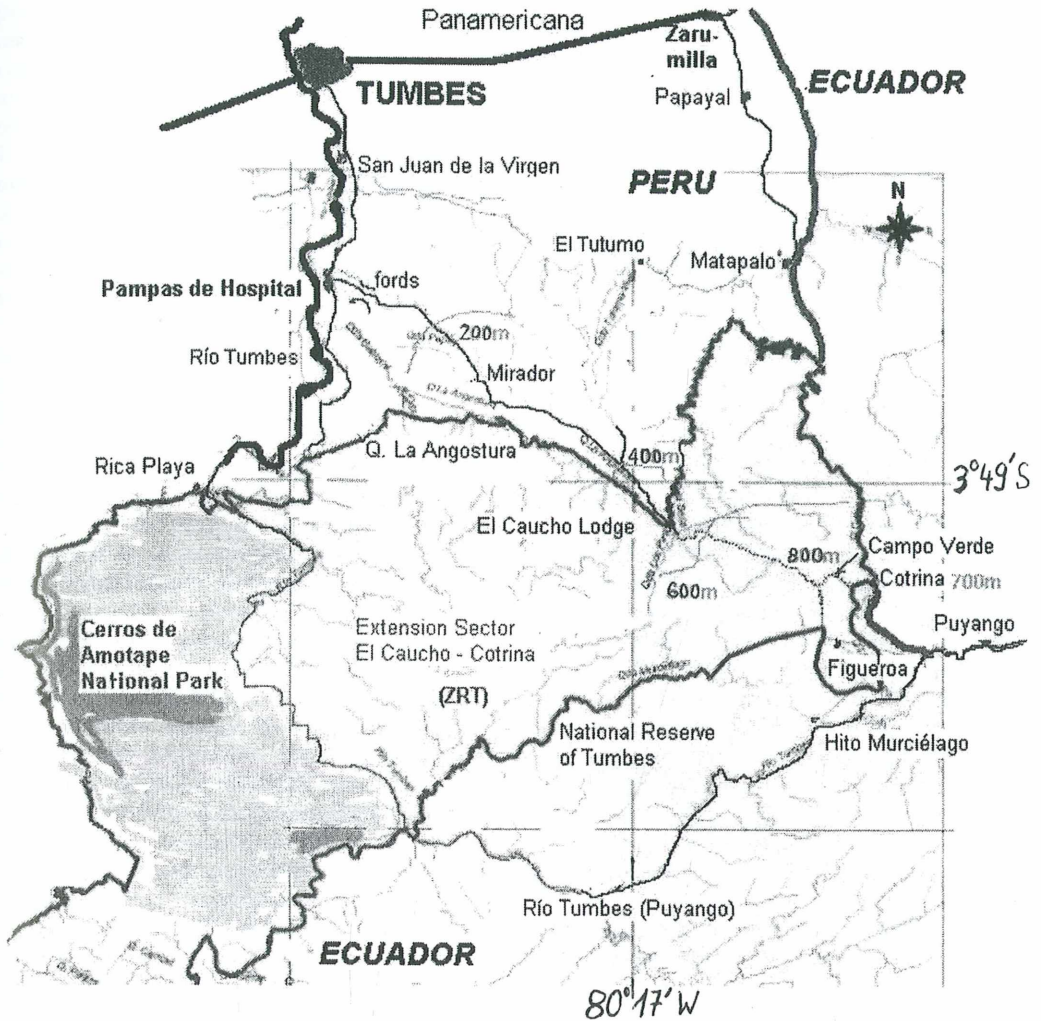


Fig. 1. Map of the study area with the new extended national park boundary. – Karte des Untersuchungsgebietes mit den neuen Nationalparkgrenzen.

The ZRT consists mainly of two vegetation zones, called eco-regions after Brack in D'Achille (1996), blending into each other around 500 m.a.s.l.: a) Tropical Deciduous Forest (Bosque Seco Ecuatorial) between c. 50 and 500 m and b) Tropical Semi-deciduous (or semi-evergreen) Forest (Bosque Tropical del Pacífico) between c. 500 and 950 m. The higher eco-region is unique for Peru. It is defined by higher amount of precipitation as in the former, as clouds from the Tumbes coast empty their load, mostly in the highest part of the Cordillera Larga during January to March. For detailed vegetation lists see Best & Kessler (1995) and Parker et al. (1995).

Many new bird species for Peru have been discovered by ornithologists in the ZRT in the last 30 years. Wiedenfeld et al. (1985) collected and observed from 14 June to 5 July 1979, discovering six species and 15 subspecies new for Peru. Parker et al. (1995) augmented the list by 31 species, six of them new for Peru. In the next 14 years, Walker (2002) and other observers (mentioned in Walker 2002) added another 41 species (see Appendix, from hereon "Ap") with five more new species for Peru. In 2004, a further two species new for Peru were found (Piana et al. 2006). With two puffbirds (Mischler 2006; Have 2009) and two hummingbirds (Bromfield

& Valqui 2010), the ZRT checklist went ultimately up to 254 species.

The purposes of this paper are a) to document the ornithological exploration of the ZRT in the last 30 years from the literature, b) to present an updated and richly commented checklist of the reserve, c) to indicate why endemic bird figures were underestimated in the past, d) to analyse, supported by data from own field-work, for the first time elevation preferences, abundance, seasonality and breeding records. It shall give conservation authorities a discussion base how to protect this part of the national park more efficiently.

Method

I conducted field assessments of bird abundance in the two different elevation zones during three excursions from 26 to 27 January 2006, from 25 to 31 August 2006 and from 13 to 16 July 2010, counting all birds species and individual numbers by walking along established trails and the access road between 06:00 and 11:30 and between 15:45 and 18:15. To give a full overview of the ornithological exploration of the area, all available information from previous assessments (most importantly Parker et al. 1995, Pyhälä 2001, Whiffin & Sadgrove 2000, Wiedenfeld et al. 1985), birdwatchers' lists (Walker 2002) and from the official INRENA (2005) list was condensed into one complete commented checklist (Ap).

As for endemism, the Tumbes EBA list (Franke et al. 2005) was re-analysed considering recent habitat contractions and augmented by taxa elevated to species rank in Ridgely & Greenfield (2001). Species were therefore classified into three categories: true endemics (after Stattersfield et al. 1998), endemics awaiting formal elevation to species rank (species in Ridgely & Greenfield 2001), and near-endemics with ranges slightly over 50,000 km² or restricted range species marginally entering neighbouring EBAs.

Two altitudinal zones were chosen according to the two eco-regions present: The lower one begins with "El Mirador", a viewpoint at roughly 200 m a.s.l. on the entrance road, reaching Faical gorge, the definite end of the road, with the police checkpoint and the new biological station at El Caucho, 370 m, and the footpaths in its vicinity up to 500 m. The higher,

moister zone above 500 m mostly follows an old, completely overgrown road to Pozo del Pato (730 m) and El Cruce (860 m) to Campo Verde (760 m), and finally to Cotrina checkpoint (710 m) directly at the border to Ecuador (Fig. 1). Altitudinal preferences of birds were examined from bird lists (Whiffin and Sadgrove 2000, Pyhälä 2001), and compared with my own observations in August (Mischler 2006). Assessment of abundance (see definitions of categories in legend to Ap) relies on Wiedenfeld et al. (1985) for the lower zone. Species not assessed there were given a category from my own observations in February and August 2006 (Mischler 2006). Most remaining species not observed by both authors could nevertheless be assessed preliminarily from textual evidence (Parker et al. 1995; Pyhälä 2001).

Seasonality patterns of each species were determined by monthly presence in the different ornithological assessments, taking into account higher abundances in some months. Confirmed breeding status was ascertained from the literature (Parker et al. 1995, Rheindt 2008, Wiedenfeld et al. 1985) plus a few additional records from M. Kessler (unpubl.) and the present study. Potential breeding status was evaluated by comparing confirmed breeding in similar habitat in Tumbesia (Mischler 2011) and verifying the bird's presence during its preferred breeding time (e.g. rainy season breeder). Comments on rare species were mainly drawn from personal observations in January and August 2006.

Results

Updated bird list of the area. The complete checklist of the birds of the ZRT presented herein allows to reconstruct the chronological exploration. Column 4 (Ap) gives a one-letter abbreviation for observers adding species after Wiedenfeld et al. (1985) up to 1988, and a two-letter abbreviation for researchers after Walker (2002) for recent discoveries (1998 to 2009, see legend to App.). The list has grown considerably from a low 145 (Wiedenfeld et al. 1985) in 1979 to 176 (Parker et al. 1995) in 1988, with M. Kessler adding nine (25 Feb to 3 Mar 1986) and T. Parker and W. Wust adding another 22 species (23 to 27 July 1988). Barry Walker's (2002) regular excursions brought the list up to 216. Other observers (Ap) have added another 31

species since. In the same time, 26 species new to Peru were found at ZRT (indexed "a" and "b" in column 3, Ap).

The official ZRT list (INRENA 2005, unpubl.) counted 267 species, 26 of which could be eliminated (Mischler 2007). In the following I give reasons for rejection of another five doubtful species from the INRENA list. *Leucopternis plumbea* Plumbeous Hawk. Erroneously included in Walker (2002) from a 1998 observation by W. Wust. Was confused with similar name and characters of Plumbeous Kite. *Piranga leucoptera* White-winged Tanager. Easily confused by name with White-shouldered Tanager. *Oryzoborus angolensis* Lesser Seed-finch. May be confused with female Blue-black Grosbeak, which has been recorded several times for the ZRT. *Schistochlamys melanopsis* Black-faced Tanager and *Hemithraupis guira* Guira Tanager. Both stated erroneously in Cook (1996) as occurring in Dep. Tumbes.

On the other hand, I included 6 species from the INRENA list, (index "c" in column 3, App.) which cannot be traced down to their observers and therefore withstand further analysis, except for status of endemism. Thus the updated list, as of July 2010, amounts to 254 species, 110 more than 25 years ago, which is the highest score for one site west of the Peruvian Andean watershed.

The most species-rich bird families of the ZRT follow. Non-passeriforms (106) are led by accipitrid raptors (19), hummingbirds (13) and doves (11 species respectively), whereas passeriforms (148) are dominated by tyrannids (42), emberizids *sensu lato* (38) as well as furnariids and antbirds (10 each). There are four near-threatened and 14 threatened species (BirdLife International 2006), ten of which are vulnerable and four endangered (Ap).

Endemism. Tumbesia (EBA 045; Región Tumbesina en Franke et al. 2005) extends from arid southwest Esmeraldas (Ecuador) to Lambayeque, Peru. With few exceptions, it is a low-lying (below 1600 m) hilly country with dry forest, excluding the extreme deserts of coastal Peru. In their analysis of the restricted range species of this EBA, Franke et al. (2005) found 55

endemic (i.e., Tumbesian) bird species, of which five were included erroneously (three, *Geositta peruviana*, *Cinclodes taczanowskii* and *Sporophila simplex*, belong in EBA 052 (Stattersfeld et al. 1998), two, *Atlapetes seebohmi*, and *Saltator nigriceps*, in EBA 046). Five species not mentioned there may range slightly over 50,000 km² (the restricted range criterion), but are typical Tumbesian endemics: *Veniliornis callonotus*, *Campephilus gayaquilensis*, *Tyrannus niveigularis*, *Attila torridus* and *Campylorhynchus fasciatus* (given "E" in Ap). One recently discovered species (Whiffin & Sadgrove 2000) for Peru, *Pteroglossus erythropygius*, is another endemic although it enters as well moister western Ecuador, as do *Turdus maculirostris* and *C. gayaquilensis*. One newly split species, *Tachycineta stolzmanni* (Robbins et al. 1997), is endemic. A further seven "species" (marked É in Ap) that await formal elevation to species status qualify as endemics. They are already split off as species in Ridgely and Greenfield (2001), but not so in Schulenberg et al. (2007). If given species status, they would make the Tumbesian region the number one for endemic birds in the world even before the Chocó EBA. Counting all these, we arrive at 53 ZRT endemics, out of 65 endemics for Tumbesia, the first figure being more than a fifth (21.8 %) of all recorded species¹. That is, the ZRT harbours an impressive 82 % of all the endemics encountered in the Tumbesian EBA.

Additionally, two more species may qualify as Tumbesian endemics: 1) *Conothraupis speculigera* Black-and-white Tanager, breeding only in Tumbesia. There is strong evidence that the breeding stronghold of this erratic species is ZRT and the area near El Tundo, Macará, Ecuador (pers. obs.). However, its post-breeding dispersal reaches east of the Andes (see new data below). 2) *Thryothorus sclateri* Speckle-breasted Wren. The distribution of this species, apart from Tumbesia, comprises one small population in south central Colombia and the subspecies *T.s. sclateri* in the upper Marañon valley, which seems to be separable specifically from the remaining Tumbesian *T.s. paucimaculatus* (Ridgely and Greenfield 2001).

The following species are regarded as near-endemics (marked "E" in Ap). They slightly

¹⁾ The 12 Tumbesian endemics not (yet) found at ZRT are: *Penelope albipennis*, *Pyrrhura orcesi* (only Ecuador), *Myrmia micrura*, *Acestrura berlepschi* (Ec), *Ochthoeca piurae*, *Tumbesia salvini*, *Myiarchus semirufus*, *Phytotoma raimondii*, *Hirundo rufocollaris*, *Piezorhina cinerea*, *Atlapetes pallidiceps* (Ec) and *Aimophila stolzmanni*.

surpass the 50.000 km² criterion for restricted range endemics. Further studies might reveal, however, that due to constriction of suitable habitat in Ecuador they will now fulfil this criterion. Two such species extend their Tumbesian range slightly into extreme south-western Colombia: *Euphonia saturata* and *Leptotila pallida* (see chapter Comments) and reach their southernmost limit in the ZRT. The next two near-endemic species show a mix of west Andean slope and Tumbesia in their very restricted geographical distribution: *Zimmerius (viridiflavus) flavidifrons* and *Mecocerculus calopterus*, both almost restricted to lower elevations of the western Andes, the latter with increasing records in outlying hills (Cerro Blanco and Masvale in Guayas; pers. obs.). Another eight species (see Ap) would qualify as endemics if Tumbesia were allowed to reach Dep. Lima. They pass down inland from the coast of central Peru where there is dry scrub habitat. Thus, estimates following a narrow species limits taxonomy (Ridgely & Greenfield 2001) and innovated EBA delimitation criteria could end up with 67 endemic species for ZRT alone.

Other biogeographical influences in the composition of the ZRT avifauna are:

- a) Ne-arctic migrants, present October to April (marked M in column 8, Ap): 11 species;
- b) Coastal, mainly freshwater birds like herons, untypical for ZRT: 15 species;
- c) Semi-desert birds tolerating light forest, typical for ZRT and mostly endemic: 8 species;
- d) West Andean subtropical slope, including two Andean species. This influence is stronger than expected. Many of these species, exclusively passeriforms, have a slight distribution gap just east of ZRT, are widely distributed on the Andean slope between 900 and 2500 m, and reach only the high portion of ZRT, where they dwell as ridge top birds: 19 species.
- e) The remaining are more widespread species preferring moister habitat amply present further north. The Ecuadorian influence is strongest. Affinities are much more Ecuadorian than Peruvian. To indicate the species which reach just over the border of Ecuador into the ZRT and no further south, a "!" sign was added behind the scientific name in the Ap. There are 35 such species found only here in the whole of Peru.

Elevation preferences. The 30 km of access road, 50 to 400 m a.s.l., and the lodge area around El Caucho up to 500 m are regarded as lower (l) elevation zone, the footpaths towards the border with the highest hills up to 950 m as the higher zone (h, Ap column 6). This correlates with the two vegetation zones described above.

To assess the preferred elevation, I used only bird assessments in which researchers (Wiedenfeld *et al.* 1985, Whiffin and Sadgrove 2000, Rheindt 2006 in litt., present study) spent roughly equal sampling effort at El Caucho (low) and Campo Verde (high). These results are comparable. In a second step (*cursive symbols* in Ap), I added from textual evidence from other authors (Pyhälä 2001, Walker 2002) plus my own observations. The latter elevation remarks are not comparable, because they reflect only singular or limited observations, or because the observer has not visited the other elevation zone.

Elevational preferences for ZRT birds are summarized in Table 1.

Tab. 1. Elevation preferences at the ZRT. (l) = below, (h) = above 500 m a.s.l.; n = number of bird species. – *Höhenpräferenzen der ZRT-Vögel: l = unter, h = über 500 m, b = beide Zonen; n = Zahl der Vogelarten.*

Elevation preference	all	comparable	
	n	n	%
low (l)	63	37	20,6
high (h)	43	22	12,3
both (b)	126	120	67,1

More than one fifth of the comparable birds prefer lower, only an eighth higher elevations; two thirds seem to be indifferent or more ubiquitous. However, many of these latter species show a preference for the one or the other ecoregion, as specified in greater detail for 123 species in Mischler (2006), but data for a general assessment are too sparse as yet. The higher elevation birds, although in the minority, provide a characteristic subset of species which are typical of the subtropical Andes (see above). Follow-up observers can amply contribute to establish the elevation preferences of the birds at ZRT. For a more in-depth analysis of habitat preferences of only endemic birds, see Best and Kessler (1995), who – as for elevation – arrive at an almost identical assessment.

Abundance. The abundance of ZRT birds was assessed first by Wiedenfeld et al. (1985) in the El Caucho area (Ap column 7). I added a second category, when own data rendered their assessment more precise. All remaining species were given a category (small print in column 7, Ap) for the first time from my own studies (Mischler 2006). A *caveat* stems from the fact that abundance categories are a function of both rarity and detectability, which biases the assessment of elusive species. A few birds may have changed their status of abundance since the field season of Wiedenfeld et al. (1985), where 20 and 12 specimens of the endangered Blackish-headed Spinetail and the vulnerable Henna-hooded Foliage-gleaner were procured, respectively. The first is no longer “fairly common”. The second flocks together only in two months around July, when there is an ample layer of freshly fallen leaves, the time it had been taken in ZRT. At other times of the year the erratic whereabouts of both species are unknown and further threats outside their preferred habitat quite certain. Finally, due to seasonal fluctuations, abundance might be severely over- or underestimated. Year-round present raptors can be rare – possibly because of their large territories –, whereas breeding season birds common from January to March are absent at other times.

The compilation presented in the Ap yields the following species numbers per category: 9 common, 38 fairly common, 48 uncommon and 150 rare. Very few birds are common, as it is forest habitat and flocking of single species – as in pastures – is almost non-existent. Apart from the above-mentioned artefacts, the overwhelming majority of birds registered as rare may be accounted for by the following factors: Birds from the Andes have only thinned-out populations here. Many species reach their southernmost limit of distribution, which is also the last tip of available Tropical Pacific Forest habitat. However, many “rare” records are stated as such due to encountering the birds in a season with minimum numbers.

Seasonality. Assessing seasonality or seasonal differences in encounter rates at the ZRT reveals many gaps, as the second half of any given year is underrepresented in observer records. The first two categories chosen in Table 2 and Ap therefore describe assumptions founded on up to eight months, and their frequent use is not-

Tab. 2. Seasonal presence of ZRT birds (data from Ap). y = present year-round, but registration gap October to mid-December; (y) = presence altogether year-round, but some months missing per individual year; I-III = present during main breeding season; IV-VIII = present in post-breeding dry season. – *Jahreszeitliche Präsenz der Vögel in der ZRT (Summe der Daten aus dem Anhang): y = ganzjährig, manche Monate fehlend wegen Beobachtungslücken; (y) = überwiegend ganzjährig, manche Monate fehlen in bestimmtem Jahr; I-III präsent zur Hauptbrutzeit; IV-VIII = präsent zur trockenen Nachbrutzeit.*

key	y	(y)	I-III	IV-VIII
No. of species	42	92	45	46

ing but tentative. In the Ap, individual months are compiled for the rarer species in order to document the actual state of records. Table 2 sums up four categories.

In the last two sections in Table 2, three species were counted twice, showing no preference for either portion of the year. The others show, however, that there are two relatively numerous groups each of only breeding time visitors and dry season visitors. Year-round presence is extrapolated from abundance categories and continued habitat use, comparing with further data from similar Cerro Blanco, Guayaquil (Mischler & Sheets 2007, Mischler 2011). Some species with almost year-round presence surely are absent during the very dry months, as their numbers increase sharply in the rainy season, but the exact time has to be detected yet. Others in this category will most likely be confirmed as definite year-round residents as soon as more records are available. Most birds present only over the wet season will qualify as breeding birds (see next chapter). It is interesting to see all four species of *Pachyramphus* becards assembled around the end of January. Most birds present only in the dry season are non-breeders, although a few specialists just use this interval after the rains for rearing their young, such as raptors, parrots, woodpeckers, woodcreepers, Pale-vented Thrush (Walker 2002) and some of the seed-eaters.

Breeding birds. Our knowledge about the breeding status of the ZRT birds shows many gaps, of course. From the literature (Parker et al. 1995, Pyhäälä 2001, Rheindt 2006, Walker 2002) and with personal data from M. Kessler (1986,

unpubl.), I was able to confirm breeding for only 33 species (Ap). However, many more species breed with little doubt here. I tried to distinguish breeding during the rainy season from dry season. The breeding bird status of a further 97 species (bracketed symbols in the Ap) should be regarded as preliminary or potential. 27 species were non-breeders, another 97 could not be assessed yet. Even if not complete, all data about breeding status compiled in this paper for the first time may be a valuable tool for conservation action.

On the positive side, it is significant that many endangered and range restricted birds find one of their breeding strongholds at the ZRT. 40 (73 %) out of 54 endemic species breed quite certainly here, and 15 (83 %) of the 18 threatened and near-threatened birds. These high percentages emphasize the conservation value of the area. Sixteen species have their southernmost breeding population here, another few find their southernmost breeding place west of the Andes here. From breeding observations in similar habitat in Tumbesia (Cerro Blanco, Mischler & Sheets 2007, Machalilla National Park, Loma Alta) it can be derived that at least half the number of species of the total checklist are breeding birds.

Comments on some new, rare and overlooked species

***Leptotila pallida* Pallid Dove.** Discovered as recently as January 2001 for Peru (Walker 2002), this unobtrusive dove probably was overlooked due to lack of ornithological research and its opportunistic and limited seasonal presence. As well, it is extremely wary and therefore often escapes detection. In the Cerro Blanco Protected Forest near Guayaquil with a similar climate and habitat, this dove is now scarce probably due to illegal hunting, where formerly it was at least uncommon (Mischler & Sheets 2007). However, if not calling, it is hard to separate in shady forest undergrowth from the equally present *L. verreauxi* White-tipped Dove. On 27 January 2006 I was able to confirm nine singing and one seen bird on a stretch of 2 road km just before El Caucho post in freshly sprouting moist underbrush. Apparently breeding territories were installed, but breeding proof for Peru is still lacking.

***Heliothrix barroti* Purple-crowned Fairy.** As already anticipated by Parker et al. (1995) as a possible candidate for Peru, as its distribution in Ecuador came as close as 5 km to the Peruvian border, this hummingbird was finally detected on 15 and 16 June 2009 by Antonio García in a gorge 300 m below Campo Verde during the LSU/Corbidi expedition (Brumfield & Valqui 2010). As being only sighted, these records need more confirmation before final inclusion into the Peru list.

***Nystalus radiatus* Barred Puffbird.** The discovery of this species, new to Peru, is described in Mischler (2006). In essence, on 29 and 30 August 2006, one adult was spotted at the highest (870 m) part of the trail near El Cruce in mature moist forest, 55 km southwest from its former southernmost occurrence at Buenaventura, Ecuador.

***Malacoptila panamensis* White-whiskered Puffbird.** On 14 Dec 2007, four individuals of this puffbird new to Peru were discovered by Wim ten Have et al. (2009) only 1 km away from the aforementioned site in the same habitat. Further confirmation of both species (year-round presence?) is needed.

***Phyllomyias cinereiceps* Ashy-headed Tyrannulet.** This species was hitherto known only from the eastern Andean slopes in Peru. In Ecuador it is sparsely distributed as well on the western Andean slope, with one record in Buenaventura being the closest so far. On 14 July 2010, at three different sites between El Caucho and Campo Verde above 450 m, I heard and saw this species in the subcanopy. On comparing its song three days later in Lima, it matches better recordings from north-west Ecuador (Xenocanto) than those from eastern Peru. From the distance, the rhythm was similar to a Tropical Pewee, but the second syllable extended into a faint and fading tremble "see-ee-ee-e". Morphological characters as ashy cap, white superciliary, yellow underparts and two thin yellowish wing-bars were once clearly seen. If accepted, this is the first record of *P. cinereiceps* in Dep. Tumbes.

***Myadestes ralloides* Andean Solitaire.** Another newcomer to the ZRT, this species was detected in the first years after 2000 (INRENA 2005

unpubl., observer and date could not be traced). I heard its clear and unmistakable song on 29 and 30 August 2006 in the highest part (850 m) of the humid forest, only the second record since its discovery. Although present on the east Andean slope of Peru in two further subspecies, the *plumbeiceps* race of ZRT was hitherto only known from the west Andean slope of Columbia and Ecuador above 700 m.

***Turdus reevei* Plumbeous-backed Thrush.** The breeding stronghold of this sporadically common thrush remains to be detected yet, but lies probably in the dry lower Andean forest around Macará, Loja, and Canchaque, Piura. It is mostly recorded in post-breeding months. At Cerro Blanco, Guayaquil, it is present only May to July as a non-breeder (Mischler & Sheets 2007). Two recent records for January and February at ZRT show, however, that it may opportunistically breed here (Pyh  la 2001, Walker 2002). The species is an intra-Tumbesian migrant with a northward dispersal to Ecuador, following the lower Andean slope.

***Conothraupis speculigera* Black-and-white Tanager,** near-threatened. It is urgent that breeding localities for this erratic species are reported, as seemingly nobody knows a definite answer to the whereabouts of its breeding strongholds. I observed constant courtship singing on 4 March 2004 near the new Jorupe/Jatumpamba reserve, 8 km east of Macará, Loja. On 28 January 2006 I counted eight evenly spaced territories of singing males (only one female seen) on a 2 km stretch on the El Caucho access road. Two males even were fighting by thrusting themselves against the rival on a branch. Thereby the wings were held half-open over the back, exposing the white wing speculum, with accompanying sounds similar to nasal, but still flute-like *Cacicus cela* vocalisations. At the end of February, pair formation seemed to have taken place, as M. Pyh  la (2001) saw two pairs (only) on 28 February 2000. At Cerro Blanco, the species has not been seen for many years, although formerly it was present sporadically in flocks, giving rise to some concern. What this Tumbesian breeding species does on its unique dispersal to the east of the Andes, remains a riddle. On 15 Aug 2007 I recorded an adult with an immature at 1500 m near San Ignacio, extreme northern Peru.

***Carduelis siemiradzkii* Saffron Siskin,** vulnerable. 10 individuals on 17 January 2001 (Walker 2002) and 12 males plus 12 females on 27 January 2006 (pers. obs.) in a dense flock feeding from herbaceous catkins prove presence during the wet season, but separation into territories takes place later. Some June/July data seemed to suffer from correct determination of the species (Parker et al. 1995), but now its presence during the dry season is established at the ZRT. For Cerro Blanco numbers and food choice of *C. siemiradzkii* see Mischler (2011). The ZRT seems to be its southernmost distribution limit (Schulenberg et al. 2007).

Discussion

Bird diversity. The sector El Caucho-Cotrina remains to be a diversity hotspot west of the Andean watershed, yielding new discoveries of formerly unnoticed species every year up to now. Parker et al. (1995, their Table 1) listed 11 species for possible ZRT candidates, recorded at less than 30 km distance from the ZRT in Ecuador. From his list, in the meantime four species were detected in the ZRT, all new for Peru. Six further new records presented in this paper show, however, that there are many more candidates to be expected for the Peruvian bird list. These Peruvian newcomers all originate from the last moist forest of considerable extent around Buenaventura, El Oro province, now protected by Fundaci  n Jocotoco. As not much moist low-lying forest habitat is left in between in south-western Ecuador, many species just leapfrog into the Cordillera Larga, part of which is the ZRT. Especially *Chlorospingus* tanagers are very likely to be expected next, but many other equally suited species reach their southernmost distribution limit at Buenaventura and therefore are possible candidates. An increase of 110 additional species in the last 25 years not only reflects increased observer activity, but probably also ongoing shifts of south Ecuadorian bird populations.

Threats. In the sector El Caucho – Cotrina, threats from hunting, petty contraband and cutting of wood, are dealt with in Parkswatch (2003) and Cook (1996). More serious problems are presented by freely roaming cattle. Trampling destroys the under-storey with many herbs essential e.g. for *Carduelis siemiradzkii*, *Arremon*

abeillei and *A. aurantiirostris*. It deprives the forest of the herb layer important for range-restricted breeding species like *Conothraupis specularis*, *Lathrotriccus griseipectus* and *Hylocryptus erythrocephalus*. Cows spread ticks. Many bushes on the paths were infested with clusters of minute ticks in August. If cattle are not withdrawn properly, funds for the park and future income from tourists might be curtailed for that reason alone.

Conservation value. The application for elevating the ZRT to national park status by INRENA (2004) made it an extension to Cerros de Amotape National Park. Its southern part is much drier, impoverished in species as compared to the ZRT (INRENA 2004). The value of the ZRT lies in that it 1) comprises a special unique eco-region: the Neotropical Pacific Xeric Forest (Bosque Tropical del Pacífico). On the Peruvian eco-region map (Brack in D'Achille 1996), the only area found for this habitat in Peru is the ZRT itself. In fact, this is the south-westernmost extension of similar habitat reaching down the western Andes of Ecuador, with strong endemism. In south-western Ecuador, this habitat is found on Cerros Hayas, Masvale and Pancho Diablo (reserve Manglares/Churute), Cerro Blanco (Guayaquil) and higher reaches of Cordillera Chongón, Loma Alta and Machalilla N.P. These (except the two latter) can be regarded as small cloud-covered islands sticking out of a denuded, semidesertic or agricultural lowland. The ZRT, in contrast, has a large contiguous area of lush forest, surrounded almost completely by dry, epiphyte-rich forest, which forms an extended lowland buffer.

2) The ZRT supports as more than 250 bird species, an astonishing number for just two habitats without larger bodies of water, a number nowhere else reached in all of western Peru down from the Andean watershed.

3) Another reason for underlining fully protected national park status is its property as a refuge. My analysis identifies 150 species as rare, many because of limited fieldwork, but at least 45 of these species may be genuinely rare. To these add a few which inside the ZRT are recorded in higher abundance classes, but are rare outside the ZRT. As neighbouring Ecuador is almost totally denuded on the boundary line with ZRT, with little remaining forest in the lower lying parts of Puyango Petrified Forest

Reserve, 10 km apart, many species from the lower western Andes just leapfrog into ZRT. As demonstrated by the presence of the Yellow-cheeked Becard (first on 30 December 1998, Pyhälä 2001) in two recent years, even eastern Andean species find their way into the ZRT.

4) The ZRT can be regarded as a source, surrounded by a sink, for many endangered breeding populations. 14 species of ZRT are threatened worldwide, but as all 14 are likewise endemic, threatening factors appear in the immediate surroundings. Twelve of these are known to have viable breeding populations here. It is not known if the ZRT also constitutes their only breeding stronghold. Four more near-threatened species, three with viable populations, all endemic, add to the birds of worldwide concern. In a soon-to-come future, the ZRT may be the only place where the birds could breed peacefully.

Finally, the ZRT is home of the highest concentration of endemic birds in the world for just one locality: of 65 Tumbesian endemics, 53 species inhabit the ZRT, of which 40 surely or probably breed here (Ap). As can be studied from the distribution maps in Schulenberg *et al.* (2007), 35 species just reach marginally Peru exclusively in the Cerros de Amotape National Park and nowhere else in Peru. 90 % of these are only found in the ZRT. So, by judging from birds, priority should be given to maintain the only Tropical Pacific Xeric Forest of Peru as a national park.

Tourism and further research. Recognizing the value of this unique area, it is only logical to promote tourism into the ZRT. As the ZRT is no longer a politically sensitive border area, international and national tourist operators have begun to set up birdwatching tours. The region is reached faster from Ecuador (to Guayaquil: 320 km) than from Lima (1350 km). Tourism in the ZRT saw a non-invasive 300 visitors in the year 2005. The necessary permit from the INRENA (national parks administration) allows to count and control access. The income from the lodge fees could be used to reinforce permanent park guard numbers.

Although the ZRT is now one of the better protected areas in western Peru, there remain more open than settled questions about understanding high endemism and synecology in Tumbesia. Researchers find an excellent ground

to pursue their biological hypotheses. The next questions are evident by studying the many gaps and uncertainties in the updated list. The aim for the next years is to evaluate the definite breeding interval for most species. Much remains to be done in pollination and seed/fruit ecology, forest management, in behavioural ornithology, breeding bird census, population ecology etc., as almost nothing is known during the course of a whole year. Assessment of rare and endemic species for conservation purposes is urgent. Further research might be able to discern breeding and non-breeding abundance. Using the new biological station at El Caucho, there might be a new impulse for academic research.

Abstract

On 11 July 2006, the former Reserved Zone of Tumbes (ZRT), situated at the border to Ecuador in extreme north-western Peru, was declared national park. This paper compiles the updated bird list for the area from previous literature and from personal fieldwork. It shows chronologically the recent discoveries for Peru. Biological field data are provided for some rare and overlooked species. For the first time, it analyses altitudinal preferences, abundance and seasonality of all birds. The analysis reveals that the ZRT has 1) the second highest number (53) of endemic bird species in the world and probably the highest for just one locality, 2) the highest biodiversity of bird species (254) west of the Peruvian Andean watershed and 3) the highest number of new country records of bird species for Peru (26) in the last 30 years. Preference of birds for lower elevations, the dry forest, is slightly more pronounced than for the higher elevations. 150 (60 %) of the species are assessed as locally rare. However, 82 % of all 65 Tumbesian endemics are encountered here. Breeding bird status has been proven for only 33 species (13 %).

Resumen. – Avifauna del sector El Caucho – Cotrina, Parque Nacional Cerros de Amotape, noroeste de Perú: nuevos registros, evaluación de endemismo, abundancia, anidación y estacionalidad.

La Zona Reservada de Tumbes (ZRT), ha sido declarada Parque Nacional a partir del 11 de julio de 2006. Para esta área, se ha elaborado la

lista completa de aves de excursiones anteriores y del propio trabajo. El análisis ornitológico trata de evaluar por primera vez para cada especie su endemismo, preferencia altitudinal, categoría de abundancia, estacionalidad y estado de anidación. También se muestra los nuevos registros de aves en el Perú. Se presentan datos biológicos para unas especies raras y poco observadas. El sector tiene unas propiedades singulares valiosas para la conservación: tiene 1) el área con el segundo más alto número (53) de especies de pájaros endémicos en el mundo y probablemente lo más alto para una sola localidad, 2) la biodiversidad más alta por un solo bosque en la vertiente occidental de los Andes peruanos para aves (247 especies) y 3) el mayor número de especies de aves registradas la primera vez en Perú en los últimos 30 años (24). Según un nuevo cálculo, en este sector se encuentran 82 % de los 65 especies de aves endémicas de Tumbesia. 53 % de las especies se encuentran en la categoría de abundancia "raro". Por el estado de anidación sólo hay 33 especies realmente comprobadas.

Acknowledgements. M. Kessler and F. Rheindt revised an earlier draft. Thanks to both for providing 6 and 2 breeding data, respectively. To all INRENA personnel, national parks administration, Tumbes, my sincerest thanks, especially to Oscar García Tello and Aldo Aguirre Cura, heads of the NW Peru Biosphere conservation areas, who gave permission for a prolonged stay, and his park rangers Ignacio, Martín and Yufani, who were informative and helpful in logistics.

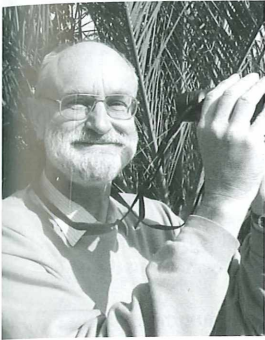
References

- Best, B. & M. Kessler (1995): Biodiversity and conservation in Tumbesian Ecuador and Peru. BirdLife International, Cambridge, U.K.
- BirdLife Internacional (2006): Species factsheet. Downloaded from: <http://www.birdlife.org> on 8/6/06
- Cook, G. 1996. Avifauna of Northwestern Peru Biosphere Reserve and its environs. Bird Conserv. Int. 6: 139-165.
- Brumfield, R.T. & T. Valqui (2010): Aves de los bosques decídúos, semidecídúos y húmedos de la Reserva de la Biosfera del Noroeste, Tumbes. [Expedición LSU/Corbidi mayo-

- julio 2009] Informe presentado a la Dirección General Forestal y de Fauna (unpubl.).
- D'Achille, B. (1996): Kuntursuyo. El territorio del cóndor. Perú: Parques nacionales y otras áreas de conservación ecológica. Ediciones Peisa, Lima.
- Franke, I., J. Mattos, L. Salinas, C. Mendoza & S. Zambrano (2005): Áreas importantes para la conservación de las aves en Perú. *In*: Bird-Life International and Conservation International (Eds.) Áreas importantes para la conservación de las aves en los Andes Tropicales: sitios prioritarios para la conservación de la biodiversidad. Quito, Ecuador: Birdlife Conservation Series No. 14.
- Have, W. ten (2009): White-whiskered Puffbird, *Malacoptila panamensis*, a new species for Peru. *Cotinga* 31: 156-157.
- INRENA, Ministerio de Agricultura & PROFO-NAMPE (2004): Propuesta de categorización de la Zona Reservada de Tumbes – ZRT. Brochure, 6 pp., Tumbes.
- Mischler, T. (2006): Buco Barreteado (*Nystalus radiatus*), nueva especie de ave para el Perú, con una lista de aves observadas en el Parque Nacional "Cerros de Amotape", Tumbes. *Boletín de Lima* 144: 83-94.
- Mischler, T. (2007): Cuidado con nuevos registros regionales! False additions to the Zona Reservada de Tumbes "official" birdlist. *Boletín UNOP* 4: 5-6 (online).
- Mischler, T. & D. Sheets (2007): Diagnostic checklist of the birds of Bosque Protector Cerro Blanco and vicinity, Guayas province, Ecuador. Senefelder, Guayaquil.
- Mischler, T. (2011): Status, abundance, seasonality, breeding evidence and the complete updated list of the birds of Cerro Blanco, Guayaquil, Ecuador. *Ornitología Neotropical* (submitted).
- Parker, T.A., T.S. Schulenberg, M. Kessler & W. Wust (1995): Natural history and conservation of the endemic avifauna in north-west Peru. *Bird Conserv. Int.* 5: 201-231.
- PARKSWATCH & D. Shoobridge (2003): Zona Reservada Tumbes. Park profile. www.parkswatch.org/parkprofiles.pdf/turz_eng.pdf
- Piana, R., F. Angulo, E. Ormaeche & C. Mendoza (2006): Two new species for Peru: Lemon-rumped Tanager *Ramphocelus icteronotus* and Black-cheeked Woodpecker *Melanerpes pucherani*. *Cotinga* 25: 78-79.
- Piana, R., S.Crespo, F.Angulo, E. Ormaeche & M. Alzamora (2010): Gray Hawk *Buteo nitidus* and Ornate Hawk-Eagle *Spizaetus ornatus* in north-west Peru. *Cotinga* 32: 37-39.
- Pople, R., I. Burfield, R. Clay, D. Cope, C. Kennedy, C. López-Lanús, J. Reyes, B. Warren & E. Yagual (1997): Bird surveys and conservation status of three sites in western Ecuador: final report of Project Ortalis '96. CSB Conservation Publications, Cambridge, U.K.
- Pyhälä, M. (2001): Informe ornitológico de una visita al norte de Perú: Tumbes – Lambayeque 1998-1999. *Boletín de Lima* 123: 100-111.
- Rheindt, F. (2008): Descripción preliminar del nido de *Pachyrhamphus spodiurus*, especie amenazada. *Cotinga* 29: 162-163.
- Ridgely, R. & P. Greenfield (2001): The birds of Ecuador. A field guide. Helm, London.
- Robbins, M., G. Rosenberg, F. Sornoza & M. Jácome (1997): Taxonomy and nest description of the Tumbes Swallow (*Tachycineta [albilinea] stolzmanni*). *Orn. Monographs* 48: 609-612.
- Schulenberg, T.S., D.F. Stotz, D. F. Lane, J. P. O'Neill & T.A. Parker (2007): Birds of Peru. Princeton University Press.
- Stattersfield, A., M. Crosby, A. Long & D. Wege (1998): Endemic Bird Areas of the world: priorities for biodiversity conservation. *Birdlife Conservation Series* 6, Cambridge.
- Walker, B. (2002): Observations from the Tumbes Reserved Zone, Dep. of Tumbes, with notes on some new taxa for Peru and a checklist of the area. *Cotinga* 18: 37-43.
- Whiffin, M. & L. Sadgrove (2000): Expedición Tumbes 2000 – Reporte preliminar. ProAves Perú, Piura.
- Wiedendorf, D.A., T.S. Schulenberg & M.B. Robbins. (1985): Birds of a tropical deciduous forest in extreme northwestern Peru. Pp. 305-315 *in*: P.A. Buckley *et al.* (eds.): *Neotropical ornithology*. *Orn. Monographs* 36. AOU, Washington D.C.
- Wust, W. (1998): Zona Reservada de Tumbes. Biodiversidad y diagnóstico socioeconómico. The John D. & Catherine C. MacArthur Foundation. PROFONAMPE, Lima.

Eingegangen am 21. Oktober 2011

Angenommen am 15. November 2011



Tino Mischler, Jg. 1950, Gymnasial- und Gitarrenlehrer. Studium in Bonn und München. Lehrte Biologie in Peru, Zimbabwe und Ecuador. Mitarbeiter der Vogelschutzwarte Garmisch-Partenkirchen 1992–2003. 10 Jahre Generalsekretär der Ornithologischen Gesellschaft in Bayern und ehemaliger Schriftleiter des „Ornithologischen Anzeigers“. Verfasste dreisprachige Weltvogelliste und ein Bestimmungsbuch der Vögel von Guayaquil. Schwerpunkte Systematik, Avifaunistik und (Höhen-)Verbreitung der Vögel. Zurzeit Natur- und Vogelführer am Rfo Napo, Ost-Ecuador.

Appendix – Anhang

Komplette Checkliste der Vögel des Nationalparks Cerros de Amotape, Sektor El Caucho – Cotrina, vormals Reservatszone Tumbes (ZRT)

Erläuterungen zu den Spalten 1 bis 8

1. Wissenschaftlicher Name: Artnamen in runden Klammern: noch gültiger Artname, aber Subspezies zur Art erhoben in Ridgely & Greenfield (2001). Gefährungskategorien als Index: **EN** = stark gefährdet, **VU** = gefährdet, **NT** = Vorwarnstufe (nahezu gefährdet). „!“ = Art mit einziger Verbreitung in Peru nur in der ZRT.
2. Endemismus: **E** = Endemit Tumbesiens; **É** = falls Subspezies zur Spezies erhoben, Endemit; (**E** = nahezu Endemit, Verbreitungsgebiet geringfügig über Tumbesien hinausreichend).
3. Englischer Vogelname: falls wissenschaftlicher Artname in Klammern, bezieht sich der englische Name auf das letzte Taxon (Subspezies). ^a = Art in Peru auf ZRT beschränkt, entdeckt vor 1990 (Parker *et al.* 1995); ^b = dto., aber entdeckt 1991–2009; ^c = Art aus offizieller ZRT-Checkliste (2005) übernommen, nicht evaluiert.
4. Autoren, die zur Checkliste beitrugen: **X** = Wiedenfeld *et al.* 14 Juni bis 5 Juli 1979; **K** = Michael Kessler 25 Feb bis 3 März 1986; **P** = Ted Parker 23 bis 27 Juli 1988; **B** = Barry Walker 1988–2001; **RW** (Richard Webster), **WW** (Walter Wust), **MP** (Mikko Pyhälä), **HN** (Hugo Noblecilla), **MW** (Mark Whiffin 2000), **RP** (Renzo Piana 2006, 2010), **TM** (Tino Mischler 2006, 2010), **WH** (Wim ten Have 2007), **TV** (Thomas Valqui 2009).
5. Höhenpräferenzen: **l** = niedrig, < 500 m; **h** = hoch, > 500 m; **b** = in beiden Höhenstufen anwesend. Normaldruck: nach Wiedenfeld *et al.* (1985) und Mischler (2006), kombiniert; *kursiv*: Angabe nach Literatur und eigener Analyse.
6. Abundanzen: Grossbuchstaben: nach Wiedenfeld *et al.* (1985), nur El Caucho; Kleinbuchstaben: Autor. Kategorien: **C** = häufig, > 10/Tag, **F** = mässig häufig, < 10/Tag, **U** = nicht häufig, Nachweis alle paar Tage, **R** = selten, nur einige Nachweise insgesamt.
7. Jahreszeitliches Auftreten: **y** = ganzjährig, (**y**) = fast ganzjährig, einige Monate fehlen (pro Jahr), **I–III** = Präsenz während der (nassen) Hauptbrutzeit, **IV** = April usw., **M** = Zugvogel aus Nordamerika, sporadisch da IX bis III.
8. Brut: **B (fett)** = Brutnachweis während der Regenzeit (I–IV), **B** = Brutnachweis außerhalb der Regenzeit, (**B**) = möglicher Brutvogel, Nachweis fehlend, leer = Brutstatus unbekannt, - (Strich) = kein Brutvogel im Gebiet. Die horizontalen Linien trennen Familien.

Appendix. Complete bird list of the Cerros de Amotape National Park, sector El Caucho – Cotrina, formerly Reserved Zone of Tumbes (ZRT)

Explanations to columns 1 to 8, Appendix

- 1 Scientific Name: (species) name in round brackets: still valid species name, but subspecies elevated to species rank in Ridgely & Greenfield (2001); threat categories: **EN** = endangered, **VU** = vulnerable, both in **bold**, **NT** = near-threatened. „!“ = species with its only distribution in Peru at the ZRT.
- 2 Endemism: **E** = Tumbesian endemic; **É** = if subspecies accepted as species, it would be endemic; (**E** = near-endemic, slightly wider range as Tumbesia).
- 3 English Name: if scientific species name in brackets, the English name refers to the last taxon (subspecies); ^a = restricted to ZRT in Peru, discovered before 1990 (Parker *et al.* 1995), ^b = species newly discovered for Peru

1991-2009 and restricted only to ZRT, ^c = species included from official ZRT checklist 2005, not further assessed.

- 4 Checklist compilers: X = Wiedenfeld *et al.* 14 June to 5 July 1979; K = Michael Kessler 25 Feb to 3 Mar 1986; P = Ted Parker 23 to 27 July 1988; B = Barry Walker 1988-2001; RW (Richard Webster), WW (Walter Wust), MP (Mikko Pyhälä), HN (Hugo Noblecilla), MW (Mark Whiffin 2000), RP (Renzo Piana 2006, 2010), TM (Tino Mischler 2006, 2010), WH (Wim ten Have 2007), TV (Thomas Valqui 2009).
- 5 Elevational Preferences: l = low, < 500 m; h = high, > 500 m; b = both, wide ranging; normal print: after Wiedenfeld *et al.* (1985), Whiffin & Sadgrove (Apr/May 2000), and Mischler (2006), combined; *curstive*: evidence from the literature and own assessment.
- 6 Abundance: capitals: assessment by Wiedenfeld *et al.* (1985), only El Caicho; small print: author; categories: C = common, >10/day; F = fairly common, <10 seen daily; U = uncommon, seen every few days; R = rare, only a few records (altogether).
- 7 Seasonality: y = present year-round, (y) = present altogether year-round, but some months missing per individual year, I-III = present during main breeding season, IV = April, etc., M = migrant of North America, irregularly present in months IX to III.
- 8 Breeding: **B (bold)** = breeding during rainy season (I-IV), B = breeding at other times (mainly after rainy season), (B) = presumed breeding, lacks proof, (blank) = breeding status not known, - = not breeding in the area. Horizontal lines separate families.

1 Scientific name	2 3 English name	4	5	6	7	8
<i>Crypturellus soui</i>	Little Tinamou	B	l	r	I-IV	(B)
<i>Crypturellus transfasciatus</i> ^{NT}	E Pale-browed Tinamou	X	b	F	y	B
<i>Fregata magnificens</i>	Magnificent Frigatebird	B	l	r		-
<i>Phalacrocorax brasilianus</i>	Neotropic Cormorant	B	l	r		-
<i>Ardea cocoi</i>	White-necked Heron	X	l	R		-
<i>Casmerodius albus</i>	Great Egret	P	l	r		-
<i>Egretta thula</i>	Snowy Egret	P	l	r		-
<i>Bubulcus ibis</i>	Cattle Egret	B	l	r		-
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	HN	l	r	VIII	
<i>Mycteria americana</i>	Wood Stork	X	l	R	VIII	
<i>Coragyps atratus</i>	Black Vulture	X	b	C	y	(B)
<i>Cathartes aura</i>	Turkey Vulture	X	b	C	y	(B)
<i>Vultur gryphus</i>	Andean Condor	TV	h	r		
<i>Sarcoramphus papa</i>	King Vulture	X	b	F	y	(B)
<i>Pandion haliaetus</i>	Osprey	B		r		-
<i>Leptodon cayanensis</i>	Grey-headed Kite	WH		r	XII	
<i>Chondrohierax uncinatus</i>	Hook-billed Kite	B	l	r	IV	
<i>Elanoides forficatus</i>	Swallow-tailed Kite	X	b	R	(y)	B
<i>Harpagus bidentatus</i>	Double-toothed Kite	TV		r		
<i>Ictinia plumbea</i>	Plumbeous Kite	B	b	u	I-VI	B
<i>Accipiter ventralis</i>	Plain-breasted Hawk		l	R	VI,VII	
<i>Accipiter bicolor</i>	Bicoloured Hawk	X	b	R	II,VI-VII	
<i>Geranospiza caerulescens</i>	Crane Hawk	X	l	R	II,IV,VI,VII	
<i>Leucopternis occidentalis</i> ^{EN 1}	E Grey-backed Hawk ^a	X	b	R/u	y	(B)
<i>Buteogallus meridionalis</i>	Savanna Hawk	B	l	r	I	
<i>Buteogallus urubitinga</i>	Great Black-hawk	X	b	R	I,II,VIII	
<i>Parabuteo unicinctus</i>	Harris' Hawk	X	l	R	(y)	
<i>Buteo nitidus</i>	Grey Hawk ^b	WH	l	r	V,VII,XII	
<i>Buteo magnirostris</i>	Roadside Hawk	P	b	u	(y)	
<i>Buteo brachyurus</i>	Short-tailed Hawk	X	h	r	(y)	
<i>Buteo albonotatus</i>	Zone-tailed Hawk	X	b	R/u	(y)	
<i>Spizaetus tyrannus</i>	Black Hawk-eagle	X	b	r	(y)	
<i>Spizaetus ornatus</i>	Ornate Hawk-eagle	RP	b	r	VII,XII	
<i>Caracara cheriway</i>	Northern Crested Caracara	X		R	VI,VII	
<i>Herpotheres cachinnans</i>	Laughing Falcon	P	b	R/u	(y)	(B)
<i>Micrastur ruficollis</i>	Barred Forest-falcon	P	h	r	VII	
<i>Micrastur semitorquatus</i>	Collared Forest-falcon	P	b	r	(y)	(B)

1 Scientific name	2 3 English name	4	5	6	7	8
<i>Falco ruficularis</i>	Bat Falcon	X	h	r	IV, VII	(B)
<i>Ortalis erythroptera</i> ^{vu} ! <i>Penelope purpurascens</i> !	E Rufous-headed Chachalaca Crested Guan ^b	X B	b h	R/u r	y I,IV,V,VIII	B
<i>Actitis macularia</i>	Spotted Sandpiper ^c					
<i>Ayamides axillaris</i> !	Rufous-necked Wood-rail	K	l	r	I-III	B
<i>Columba speciosa</i>	Scaled Pigeon	K	h	r	I-III	
<i>Columba plumbea</i>	Plumbeous Pigeon	X	b	r	(y)	
<i>Columba subvinaea</i>	Ruddy Pigeon	P	h	r	(y)	
<i>Zenaida auriculata</i>	Eared Dove	X	l	R	(y)	
<i>Zenaida (asiatica) meloda</i>	Pacific Dove ^c					
<i>Columbina buckleyi</i>	E Ecuadorian Ground-dove	X	l	F	y	(B)
<i>Columbina cruziana</i>	Croaking Ground-dove	X	b	C	y	(B)
<i>Claravis pretiosa</i>	Blue Ground-dove	X	b	R	(y)	(BB)
<i>Leptotila verreauxi</i>	White-tipped Dove	X	b	F	y	B
<i>Leptotila ochraceiventris</i> ^{vu}	E Ochre-bellied Dove	P	b	u	I-III,VII	(B)
<i>Leptotila pallida</i> !	(E) Pallid Dove ^b	B	l	r	I-III	(B)
<i>Aratinga erythrogenys</i> st	E Red-masked Parakeet	X	b	U	y	(BB)
<i>Forpus coelestis</i>	E Pacific Parrotlet	X	l	U	y	(B)
<i>Brotogeris pyrrhoptera</i> ^{EN} !	E Grey-cheeked Parakeet	X	b	F	y	(BB)
<i>Pionus chalcopterus</i> !	Bronze-winged Parrot	X	b	R/u	(y)	(B)
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	B	b	r	M	-
<i>Coccyzus lansbergi</i> !	Grey-capped Cuckoo	K	b	r	I-III	(B)
<i>Piaya cayana</i>	Squirrel Cuckoo	X	b	U	(y)	(B)
<i>Crotophaga sulcirostris</i>	Groove-billed Ani	X	b	R	(y)	(B)
<i>Tapera naevia</i>	Striped Cuckoo	B	b	r	I,IV,VIII	
<i>Otus roboratus</i>	(E) Peruvian Screech-owl	X	l	U	II,IV,VI,VII	
<i>Ciccaba nigrolineata</i> !	Black-and-white Owl	P	b	r	I,IV,VII,VIII	(B)
<i>Ciccaba virgata</i>	Mottled Owl	TV	h	r		
<i>Pulsatrix perspicillata</i>	Spectacled Owl	X	b	U	(y)	(B)
<i>Glaucidium peruanum</i>	Peruvian Pygmy-owl	X	b	U	y	(B)
<i>Athene cucularia</i>	Burrowing Owl	B	l	r	(y)	
<i>Nyctibius griseus</i>	Grey Potoo ^c					
<i>Chordeiles acutipennis</i>	Lesser Nighthawk	B	l	r		
<i>Nyctidromus albicollis</i>	Pauraque	X	b	U	(y)	B
<i>Caprimulgus anthonyi</i>	E Scrub Nightjar	RW	l	r	II	
<i>Streptoprocne zonaris</i>	White-collared Swift	X	b	R	(y)	-
<i>Chaetura cinereiventris</i>	Grey-rumped Swift	X	b	F	(y)	-
<i>Chaetura pelagica</i>	Chimney Swift	B	l	r	M	-
<i>Chaetura (brachyura) ocybetes</i>	E Tumbes Swift	X	b	F	(y)	
<i>Panyptila cayennensis</i>	Lesser Swallow-tailed Swift	X	l	R	II,VI-VIII	-
<i>Phaethornis (longirostris) baroni</i> !	E Baron's Hermit	X	b	F	(y)	(B)
<i>Phaethornis griseogularis</i>	Grey-chinned Hermit	X	l	U	V-VII	
<i>Anthracothorax prevostii</i> !	Green-breasted Mango ^c	B		r		-
<i>Thalurania (fauyi) hypochlora</i> !	E Emerald-bellied Woodnymph ^b	P	b	u	(y)	
<i>Damophila julie</i> !	Violet-bellied Hummingbird ^c	X	b	R/u	(y)	
<i>Leucippus baeri</i>	E Tumbes Hummingbird	B	l	r		
<i>Amazilia tzacatl</i> !	Rufous-tailed Hummingbird ^b	TV	h	r		
<i>Amazilia amazilia</i>	(E) Amazilia Hummingbird	X	b	C	y	(B)
<i>Amazilia franciae</i>	Andean Emerald	TV	h	r		
<i>Heliothrix barroti</i> !	Purple-crowned Fairy ^b	TV	h	r		
<i>Chalybura buffonii</i> !	White-vented Plumeleteer ^c	X	h	u	(y)	B
<i>Helimaster longirostris</i>	Long-billed Starthroat	X	l	U	(y)	(B)
<i>Acestrura bombus</i> ^{vu}	(E) Little Woodstar ^c					
<i>Trogon (melanurus) mesurus</i>	E Ecuadorian Trogon	X	b	F	y	(B)
<i>Trogon violaceus concinnus</i>	Northern Violaceous Trogon	X	l	r	(y)	(B)

1 Scientific name	2 3 English name	4	5	6	7	8
<i>Megaceryle torquata</i>	Kinged Kingfisher	P	l	u	(y)	(B)
<i>Chloroceryle americana</i>	Green Kingfisher	X	l	U	(y)	(B)
<i>Nystalus radiatus</i> !	Barred Puffbird ^b	TM	h	r	VIII	-
<i>Malacoptila panamensis</i> !	White-whiskered Puffbird ^b	WH	h	r	XII	
<i>Momotus momota</i>	Blue-crowned Motmot	X	l	F	(y)	B
<i>Pteroglossus erythropygius</i> !	E Pale-mandibled Aracari ^b	MW	h	r	v	-
<i>Picumnus olivaceus</i>	Olivaceous Piculet	P	h	r	I,VII	
<i>Picumnus sclateri</i>	E Ecuadorian Piculet	X	b	F	y	(B)
<i>Veniliornis callonotus</i>	E Scarlet-backed Woodpecker	X	b	F	y	(B)
<i>Veniliornis kirkii</i> !	Red-rumped Woodpecker ^a	X	b	R/u	(y)	B
<i>Melanerpes pucherani</i> !	Black-cheeked Woodpecker ^b	RP	l	r	VIII	-
<i>Piculus rubiginosus</i>	Golden-olive Woodpecker	X	b	U	(y)	(B)
<i>Dryocopus lineatus</i>	Lineated Woodpecker	X	b	R/u	(y)	(B)
<i>Campephilus gajaquilensis</i> ^{NT}	E Guayaquil Woodpecker	X	b	R/u	(y)	(B)
<i>Dendrocincla fuliginosa</i>	Plain-brown Woodcreeper	X	b	r	(y)	(B)
<i>Sittasomus griseicapillus</i>	Olivaceous Woodcreeper	X	b	F	(y)	(B)
<i>Xiphocolaptes promeropygus</i>	Strong-billed Woodcreeper	X	b	R	(y)	(B)
<i>Lepidocolaptes souleyetii</i>	Streak-headed Woodcreeper	X	b	C	y	(B)
<i>Campylorhamphus trochilirostris</i>	Red-billed Scythebill	X	b	U	(y)	(B)
<i>Campylorhamphus pusillus</i>	Brown-billed Scythebill ^c					
<i>Furnarius (leucopus) cinnamomeus</i>	E Pacific Hornero	X	b	F	y	B
<i>Synallaxis azarae</i>	Azara's Spinetail		h	r	(y)	(B)
<i>Synallaxis brachyura</i> !	Slaty Spinetail ^a	X	h	r	(y)	(B)
<i>Synallaxis tithys</i> ^{EN} !	E Blackish-headed Spinetail	X	b	F/u	(y)	B
<i>Synallaxis stictothorax</i>	E Necklaced Spinetail	WW	l	r	I	(B)
<i>Syndactyla ruficollis</i> ^{vu}	E Rufous-necked Foliage-gleaner	X	b	R	(y)	(B)
<i>Automolus rubiginosus</i>	Ruddy Foliage-gleaner	B	l	r	I-III	
<i>Hyalocryptus erythrocephalus</i> ^{vu}	E Henna-hooded Foliage-gleaner	X	b	U	(y)	B
<i>Xenops rutilans</i>	Streaked Xenops	X	b	U	(y)	B
<i>Xenops minutus</i>	Plain Xenops	P	h	r	IV,VII,VIII	
<i>Taraba major</i>	Great Antshrike	X	h	u	(y)	(B)
<i>Sakesphorus bernardi</i>	E Collared Antshrike	X	b	F	y	B
<i>Thamnophilus zarumae</i>	E Chapman's Antshrike	X	h	r	(y)	B
<i>Thamnophilus atrinucha</i> !	Western Slaty-antshrike ^b	B	b	r	I,IV,V	
<i>Dysithamnus mentalis</i>	Plain Antvireo	X	b	F	y	(B)
<i>Pyriglena leuconota</i>	White-backed Fire-eye	X	b	u	(y)	B
<i>Myrmeciza griseiceps</i> ^{vu}	E Grey-headed Antbird	X	h	r	(y)	(B)
<i>Grallaria guatimalensis</i>	Scaled Antpitta	K	h	r/F	I-V	(B)
<i>Grallaria watkinsi</i> !	E Watkins' Antpitta ^a	X	b	F	(y)	(B)
<i>Melanopareia elegans</i>	E Elegant Crescentchest	X	l	R	(y)	(B)
<i>Mionectes oleagineus</i>	Ochre-bellied Flycatcher	X	b	R	(y)	
<i>Mionectes olivaceus</i>	Olive-striped Flycatcher ^c					
<i>Zimmerius (viridiflavus) flavidifrons</i>	(E) Loja Tyrannulet	X	h	r	(y)	
<i>Phyllomyias griseiceps</i>	Sooty-headed Tyrannulet	WW	h	r		
<i>Phyllomyias cinereiceps</i>	Ashy-headed Tyrannulet	TM	h	r		
<i>Camptostoma obsoletum</i>	Southern Beardless-tyrannulet	X	b	F	y	B
<i>Phaeomyias (murina) tumbezana</i>	E Tumbesian Tyrannulet	B	b	r		(B)
<i>Myiopagis subplacens</i>	E Pacific Elaenia	X	b	F	(y)	B
<i>Myiopagis viridicata</i>	Greenish Elaenia	B	b	r	I-III,VIII	
<i>Mecocerculus calopterus</i>	(E) Rufous-winged Tyrannulet	X	b	u	(y)	
<i>Pseudelaenia leucospodia</i>	E Grey-and-white Tyrannulet	B	l	r	II	
<i>Leptopogon superciliosus</i>	Slaty-capped Flycatcher	K	b	u/r	I-III,VIII	B
<i>Euscarthmus melorhynchus</i>	Tawny-crowned Pygmy-tyrant	X	b	F	(y)	(B)
<i>Lophotriccus pileatus</i>	Scale-crested Pygmy-tyrant	X	b	U	y	(B)
<i>Todirostrum cinereum</i>	Common Tody-flycatcher	X	b	F	(y)	(B)

1 Scientific name	2 3 English name	4	5	6	7	8
<i>Tolmomyias sulphurescens</i>	Yellow-olive Flycatcher	X	b	F	y	(B)
<i>Platyrinchilus mystaceus</i>	White-throated Spadebill	P	h	r	IV, VII	
<i>Onychorhynchus occidentalis</i> ^{vu!}	E Pacific Royal Flycatcher	X	b	R	(y)	B
<i>Myiophobus fasciatus</i>	Bran-coloured Flycatcher	X	b	U	(y)	(B)
<i>Myiobius atricaudus</i>	Black-tailed Flycatcher	X	b	U	(y)	(B)
<i>Lathrotriccus griseipectus</i> ^{vu}	E Grey-breasted Flycatcher	P	b	u	(y)	(B)
<i>Empidonax alhorum</i>	Alder Flycatcher	WW		r	M	-
<i>Contopus cooperi</i>	Olive-sided Flycatcher	B	h	r	M	-
<i>Contopus fumigatus</i>	Smoke-colored Pewee	X	b	U	VI-VIII	
<i>Contopus (cinereus) punensis</i>	E Tumbes Pewee	X	b	F	(y)	B
<i>Sayornis nigricans</i>	Black Phoebe	B	l	r	II,IV,VIII	(B)
<i>Pyrocephalus rubinus</i>	Vermilion Flycatcher	X	b	F	y	(B)
<i>Attila torridus</i> ^{vu!}	E Ochraceous Attila ^b	P	h	r	(y)	(B)
<i>Myiarchus tuberculifer</i>	Dusky-capped Flycatcher	X	h	r	I,II,VI-VII	
<i>Myiarchus phaeocephalus</i>	E Sooty-crowned Flycatcher	X	b	U	y	(B)
<i>Tyrannus tyrannus</i>	Eastern Kingbird	WW		r	M	-
<i>Tyrannus melancholicus</i>	Tropical Kingbird	B		r	II,IV	
<i>Tyrannus niveigularis</i>	E Snowy-throated Kingbird	B	l	r	I,II	
<i>Megarynchus pitangua</i>	Boat-billed Flycatcher	X	b	R/u	y	(B)
<i>Myiodynastes bairdii</i>	E Baird's Flycatcher	X	l	F	y	(B)
<i>Myiodynastes maculatus</i>	Streaked Flycatcher	X	b	R/u	(y)	(B)
<i>Legatus leucophaeus</i>	Piratic Flycatcher	MP	l	r	II,VIII	
<i>Myiozetetes similis</i>	Social Flycatcher	B	l	r	I,IV	
<i>Pachyrhamphus albogriseus</i>	Black-and-white Becard	X	b	R	I,II,IV,VII	
<i>Pachyrhamphus xanthogenys</i>	Yellow-cheeked Becard	B	l	r	XII,I	-
<i>Pachyrhamphus spodiurus</i> ^{EN}	E Slaty Becard	X	b	R	I,II,VI-VII	B
<i>Pachyrhamphus homoclitrous</i>	One-colored Becard	B	l	u	I-IV,VIII	(B)
<i>Manacus manacus</i>	White-bearded Manakin	X	h	r	IV,VI,VII	
<i>Schiffornis turdinus</i>	Thrush-like Schiffornis	X	b	R	(y)	
<i>Cyanocorax mystacalis</i>	E White-tailed Jay	P	l	f	(y)	B
<i>Cyclarhis gujanensis</i>	Rufous-browed Peppershrike	X	b	F	y	(B)
<i>Vireo olivaceus</i>	Red-eyed Vireo	X	b	R/u	(y)	(B)
<i>Hylophilus decurtatus!</i>	Lesser Greenlet*	X	b	R	(y)	
<i>Myadestes ralloides</i>	Andean Solitaire	TM	h	r	VIII	
<i>Catharus dryas</i>	Spotted Nightingale-thrush	X	b	R	(y)	
<i>Catharus ustulatus</i>	Swainson's Thrush	K	h	r	M	-
<i>Turdus reevei</i>	E Plumbeous-backed Thrush	X	b	F	I,II,IV-VIII	
<i>Turdus obsoletus!</i>	Pale-vented Thrush ^b	B	l	r	IV,VI	B
<i>Turdus (nudigenis) maculirostris!</i>	E Ecuadorian Thrush*	X	b	U	y	B
<i>Mimus longicaudatus</i>	(E) Long-tailed Mockingbird	X	l	R	(y)	(B)
<i>Progne chalybea</i>	Grey-breasted Martin	X	b	U	y	(B)
<i>Notiochelidon cyanoleuca</i>	Blue-and-white Swallow	WW				
<i>Tachycineta stolzmanni</i>	E Tumbes Swallow	HN	l	r		
<i>Stelgidopteryx ruficollis</i>	Southern Rough-winged Swallow	WW	b		II	
<i>Campylorhynchus fasciatus</i>	E Fasciated Wren	X	b	C	y	(B)
<i>Thryothorus sclateri</i>	(E) Speckle-breasted Wren	X	b	F	y	B
<i>Thryothorus supercilialis</i>	E Superciliated Wren	B	l	r		
<i>Troglodytes aedon</i>	House Wren	X	b	F	y	(B)
<i>Henicorhina leucophrys</i>	Grey-breasted Wood-wren	X	h	r	(y)	(B)
<i>Ramphocaeus melanurus</i>	Long-billed Gnatwren	X	h	r	(y)	(B)
<i>Polioptila plumbea</i>	Tropical Gnatcatcher	X	b	F	y	(B)
<i>Parula pitiayumi</i>	Tropical Parula	X	b	F	y	B
<i>Dendroica fusca</i>	Blackburnian Warbler	B	h	r	M	-
<i>Wilsonia canadensis</i>	Canada Warbler	B		r	M	-
<i>Geothlypis aequinoctialis</i>	Masked Yellowthroat	X	b	U	(y)	B

1 Scientific name	2 3 English name	4	5	6	7	8
<i>Myioborus miniatus</i>	Slate-throated Redstart	X	b	r	(y)	(B)
<i>Basileuterus fraseri</i>	E Grey-and-gold Warbler	X	b	F	y	B
<i>Basileuterus trifasciatus</i>	E Three-banded Warbler	X	b	u	y	(B)
<i>Coereba flaveola</i>	Bananaquit	X	b	U	y	(B)
<i>Euphonia saturata</i> !	(E) Orange-crowned Euphonia	B	h	r	I,II,IV	B
<i>Euphonia lamiirostris</i>	Thick-billed Euphonia	X	b	F	(y)	
<i>Euphonia xanthogastra</i>	Orange-bellied Euphonia	X	b	r	VI-VIII	
<i>Pipraeidea melanonota</i>	Fawn-breasted Tanager	K	l	r	II,IV	
<i>Tangara icterocephala</i> !	Silver-throated Tanager ^b	B	h	r	II,IV	
<i>Tangara ruficervix</i>	Golden-naped Tanager	MP	l	r	II	-
<i>Tangara gyrola</i>	Bay-headed Tanager	X	h	u	(y)	
<i>Thraupis episcopus</i>	Blue-grey Tanager	X	b	F	y	(B)
<i>Ramphocelus icteronotus</i> !	Lemon-rumped Tanager ^b	RP	l	r	VIII	
<i>Tachyphonus luctuosus</i>	White-shouldered Tanager	K	b	u	I,II,IV,VIII	(B)
<i>Piranga flava</i>	Hepatic Tanager	X	b	U	(y)	(B)
<i>Piranga rubra</i>	Summer Tanager	B	l	r	M	-
<i>Piranga olivacea</i>	Scarlet Tanager	MP	l	r	M	-
<i>Chlorospingus canigularis</i>	Ashy-throated Bush-tanager	X	b	r	(y)	(B)
<i>Conothraupis speculigera</i> ^{NT}	Black-and-white Tanager	K	b	r/u	I-III	(B)
<i>Saltator maximus</i>	Buff-throated Saltator	X	h	u	(y)	(B)
<i>Saltator (albicollis) striatipectus</i>	Streaked Saltator	X	b	F	(y)	(B)
<i>Pheucticus chrysogaster</i>	Golden-bellied Grosbeak	X	b	U	(y)	(B)
<i>Cyanocompsa cyanoides</i>	Blue-black Grosbeak	X	h	r	(y)	(B)
<i>Rhodospingus cruentus</i>	E Crimson Finch-tanager	X	b	U	(y)	(B)
<i>Volatinia jacarina</i>	Blue-black Grassquit	P	b	r	(y)	(B)
<i>Tiaris obscura</i>	Dull-coloured Grassquit	X	b	R	(y)	
<i>Sporophila corvina</i>	Variable Seedeater	X	b	C	y	(B)
<i>Sporophila luctuosa</i>	Black-and-white Seedeater	B		r	IV	
<i>Sporophila nigricollis</i>	Yellow-bellied Seedeater	X	b	r	II,IV,VII	
<i>Sporophila peruviana</i>	(E) Parrot-billed Seedeater	X		r	IV	
<i>Sporophila telasco</i>	Chestnut-throated Seedeater	X	b	R	(y)	
<i>Phrygilus plebejus</i>	Ash-breasted Sierra-finch	X	l	U	I,II,IV,VII	
<i>Sicalis flaveola</i>	Saffron Finch	X	l	u	(y)	(B)
<i>Sicalis taczanowskii</i>	E Sulphur-throated Finch	B	l	r		
<i>Atlapetes leucopterus</i>	White-winged Brush-finch	X	b	C	(y)	(B)
<i>Atlapetes albiceps</i>	E White-headed Brush-finch	X	l	R	I,VII	
<i>Atlapetes torquatus</i>	Stripe-headed Brush-finch	X	b	U	(y)	
<i>Arremon aurantiirostris</i>	Orange-billed Sparrow	X	h	r	II,IV,VI-VII	
<i>Arremon abeillei</i>	E Black-capped Sparrow	X	b	C	y	B
<i>Arremonops conirostris</i> !	Black-striped Sparrow ^b	P	h	r	VIII	
<i>Poospiza hispaniolensis</i>	(E) Collared Warbling-finch	P		r	VII	
<i>Cacicus cela</i>	Yellow-rumped Cacique	X	b	R/f	(y)	(B)
<i>Amblycercus holosericeus</i>	Yellow-billed Cacique	X	b	F/u	(y)	(B)
<i>Icterus mesomelas</i>	Yellow-tailed Oriole	X	b	F	(y)	B
<i>Icterus graceanae</i>	E White-edged Oriole	X	l	U	(y)	(B)
<i>Sturnella bellicosa</i>	Peruvian Meadowlark	B	l	r	I,IV	
<i>Dives warszewiczi</i>	(E) Scrub Blackbird	P	l	u	(y)	(B)
<i>Molothrus bonariensis</i>	Shiny Cowbird	B	l	u	I,II,IV	(B)
<i>Scaphidura oryzivora</i>	Giant Cowbird	B		r	IV	
<i>Carduelis siemiradzki</i> ^{VU} !	E Saffron Siskin ^a	X	b	R	I,II,VI-VIII	(B)
<i>Carduelis xanthogastra</i>	Yellow-bellied Siskin	B	h	r	I,II,IV	
<i>Carduelis psaltria</i>	Lesser Goldfinch	B		r		

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Ornithologischer Anzeiger](#)

Jahr/Year: 2011

Band/Volume: [50_1](#)

Autor(en)/Author(s): Mischler Tino

Artikel/Article: [Avifauna of the sector El Caucho - Cotrina, Cerros de Amotape National Park, north-western Peru: chronology of recent discoveries, assessment of endemism, abundance, breeding and seasonality 26-42](#)