

NOTES ON THE PUNA AVIFAUNA OF AZÁNGARO PROVINCE, DEPARTMENT OF PUNO, SOUTHERN PERU

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ABSTRACT.—In June 1975, we made the first dry (winter) season observations of puna birds in the Province of Azángaro, Department of Puno, southern Peru, adding nine species to the avifaunal list for the area. We observed no trochilids although they are known to be numerous during the wet (summer) season. Nesting of the Golden-spotted Ground-Dove (*Metriopelia aymara*) is described for the first time from Peru, and we report the breeding on the puna of two puna species that have been recorded on the coast in the dry season. We discuss altitudinal migration to the Pacific coast during the dry season, and include a species list for this puna region. *Received 25 April 1978, accepted 4 January 1979.*

THE purpose of this paper is to document sight records of birds made in the period 6–17 June 1975 at Hacienda Checayani, Province of Azángaro, Department of Puno, southern Peru. At the time we were engaged in a field study of the taruca (*Hippocamelus antisensis*, Cervidae), which we have reported elsewhere (Roe and Rees 1976). Our visit occurred 14 yr after Jean Dorst visited Checayani. His articles on the avifauna there and elsewhere in the Department of Puno are profuse (Dorst 1956a, b, c, d; 1957a, b; 1962a, b, c; 1963; 1972). However, Dorst's two visits to southern Peru both took place during the wet season (to which he consistently refers as the breeding season) from December 1954 to March 1955 and from November 1960 to February 1961. Our study reports observations made during the dry season, which was not included among Dorst's visits.

Both Dorst (1956a) and Pearson and Plenge (1974) have suggested that a substantial altitudinal migration of puna avifauna to the coast occurs during the dry season (approximately April–September). This they associate with a reduction in habitat, particularly for aquatic-oriented species, as water freezes in some locations. Although our species list is not complete, we feel it may shed some light on the concept of altitudinal migration and breeding seasons in the puna biome.

STUDY AREA AND METHODS

The puna grassland habitat at Checayani has been described elsewhere (Dorst 1956a, Roe and Rees 1976). In brief, the region is characterized by broad, flat, and frequently marshy valley bottoms between steep-sided, rounded hills and plateaux. The climate is notable for wide diurnal fluctuation in temperature and markedly seasonal distribution of rainfall. Daily temperature typically ranges over 15 or 20°C, with overnight frost possible during any month of the year. The minimum altitude in the study area is 3,900 m. Of the 500–1,000 mm annual precipitation, 80–90% occurs between the end of November and mid-April, with the height of the dry season occurring in June and July (Baker 1968). During our study, heavy frosts occurred every night, but daytime temperatures frequently reached 18°C. We were advised that the weather was unusually warm and wet for that time of year. Many of the puna species exhibit adaptations to such daily temperature extremes (see Dorst 1956a, 1962a, 1963, 1972).

With the aid of 8 × 40 binoculars and a 20–45 × spotting scope, we made detailed field notes describing

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TABLE 1. Bird species recorded from the puna of the Department of Azángaro, Peru.

Family	Species ^a	Dorst reference	Dorst date	This study (6-17 June)
Tinamidae	<i>Nothoprocta ornata</i>	1957a	7 Sept.	×
	<i>N. penlandii</i>			×
	<i>Nothura maculosa</i>	1956b 1962c	5 Feb. 7 Dec.-11 Jan.	
Podicipedidae	<i>Podiceps rolland</i>	1956b 1962c	20-26 Jan. 4 Jan.	×
	<i>P. occipitalis</i>			×
Phalacrocoracidae	<i>Phalacrocorax olivaceus</i>	1956b 1962c	20 Jan.; 5 Feb. 13 Dec.-4 Jan.	×
Ardeidae	<i>Casmerodius albus</i>	1956a	None given	
	<i>Nycticorax nycticorax</i>	1962c	31 Dec.-4 Jan.; 17 Jan.	×
Threskiornithidae	<i>Theristicus caudatus</i>	1956b	30 Jan.	
	<i>Plegadis ridgwayi</i>	1956b 1962c	25, 29 Jan. 20 Dec.	×
Phoenicopteridae	<i>Phoenicopterus chilensis</i>	1956b 1962c	3 May 6 Dec.	
Anatidae	<i>Chloephaga melanoptera</i>	1957a	7 June	×
	<i>Anas flavirostris</i>	1956b 1962c	26 Jan.-4 Feb. 22-27 Dec.	×
	<i>A. georgica</i>	1956b 1962c	23 Jan.-4 Feb. 16-17 Jan.	×
	<i>A. versicolor</i>	1956b 1962c	20, 25 Jan. 13 Dec.-4 Jan.	×
	<i>A. cyanoptera</i>	1956b	26 Jan.-20 Feb.	×
	<i>Oxyura jamaicensis</i>	1956b 1962c	20 Jan.-5 Feb. 4 Jan.	×
	<i>Oxyura</i> sp. ("white-headed stifftail")			×
Cathartidae	<i>Vultur gryphus</i>	1956a	None given	
	<i>Cathartes aura</i>	1957a	6 June	
Accipitridae	<i>Buteo poecilochrous</i>	1956b 1962c	4 Feb.; 28 Apr. 10-12 Dec.	×
	<i>Circus cyaneus</i>	1956b	11 Feb.	×
Falconidae	<i>Phalcobaenus megalopterus</i>	1956b 1962c	24 Jan. 3, 17 Jan.	×
	<i>Falco femoralis</i>			×
	<i>F. sparverius</i>	1956b 1962c	3 Feb. 22 Jan.	×
Rallidae	<i>Rallus sanguinolentus</i>	1956b 1962c	30 Jan. 4 Dec.	
	<i>Gallinula chloropus</i>	1956b 1962c	25 Jan.; 20 Dec. 3 Jan.	×
	<i>Fulica americana</i>	1956b 1962c	26 Jan. 13 Dec.	×
	<i>F. ardesiaca</i>	1956a	None given	
	<i>F. gigantea</i>	1956b	25 Jan.; 4 Jan.	×
Charadriidae	<i>Vanellus resplendens</i>	1956b	4 Feb.	×
	<i>Oreopholus ruficollis</i>	1957a	20 May	
Scolopacidae	<i>Tringa melanoleuca</i>	1956a, b 1962c	21 Jan.; 4 Feb. 22 Dec.; 13 Jan.	×
	<i>T. flavipes</i>	1956a 1962c	20 Dec. 16-17 Jan.	
	<i>Calidris bairdii</i>	1956a	6 Dec.	
	<i>C. melanotos</i>	1956b	30 Jan.	
	<i>Gallinago (Capella) gallinago</i>	1956b 1962c	29 Jan. 20 Dec.-12 Jan.	×
Thinocoridae	<i>Thinocorus orbignyianus</i>	1962c	17 Jan.	

TABLE 1. Continued.

Family	Species ^a	Dorst reference	Dorst date	This study (6-17 June)	
Laridae	<i>Larus serranus</i>	1956b 1962c	25 Jan.; 5 Feb. 13 Dec.-4 Jan.	×	
Columbidae	<i>Zenaida auriculata</i>	1957a	5 June		
	<i>Metriopelia ceciliae</i>	1956b	23 Jan.	×	
	<i>M. aymara</i>			×	
	<i>M. melanoptera</i>	1956b	23 Jan.	×	
Psittacidae	<i>Bolborhynchus aurifrons</i>	1956b 1962c	21 Jan.; 25 Apr. 15 Dec.		
	<i>B. orbynesius</i>			×	
Tytonidae	<i>Tyto alba</i>	1956b	15 Feb.	×	
Strigidae	<i>Bubo virginianus</i>	1957a	7 June		
	<i>Speotyto (Athene) cucularia</i>	1956b 1962c	30 Jan. 29 Dec.		
Caprimulgidae	<i>Uropsalis segmentata</i>			×	
Trochilidae	<i>Colibri coruscans</i>	1956b	9-18 Jan.		
	<i>Oreotrochilus estella</i>	1956b 1962c	26 Jan.-18 Feb. 23 Nov.-19 Jan.		
	<i>Patagona gigas</i>	1956a	None given		
	<i>Colaptes rupicola</i>	1956b 1962c	13 Feb. 10 Dec.-18 Jan.	×	
Picidae	<i>Colaptes rupicola</i>	1956b 1962c	13 Feb. 10 Dec.-18 Jan.	×	
Furnariidae	<i>Geositta cucularia</i>	1962c	3, 6 Dec.; 17 Jan.		
	<i>G. tenuirostris</i>	1956b 1962c	15 Feb. 8 Dec.-16 Jan.	×	
	<i>Upucerthia validirostris</i>	1956b 1962c	26 Apr. 23 Nov.-9 Jan.	×	
	<i>U. serrana</i>			×	
	<i>Cinclodes fuscus</i>	1956b 1962c	2-17 Feb. 22 Nov.-16 Jan.	×	
	<i>C. atacamensis</i>	1956b 1962c	10 Feb. 19 Dec.-18 Jan.	×	
	<i>Phleocryptes melanops</i>	1956b 1962c	20 Jan.-5 Feb. 21 Dec.	×	
	<i>Leptasthenura andicola</i>	1956b 1962c	26 Jan. 23 Nov.-19 Jan.		
	<i>Asthenes dorbignyi</i>	1956b 1962c	8, 20 Feb. 27 Dec.-1 Jan.	×	
	<i>A. wyatti</i>	1962c	19 Dec.-14 Jan.	×	
	Tyrannidae	<i>Agriornis montana</i>	1957a 1962c	15 July 8 Dec.-17 Jan.	×
		<i>A. albicauda</i>			×?
		<i>Muscisaxicola rufivertex</i>	1962c	8 Dec.-9 Jan.	×
<i>M. alpina</i>				×	
<i>Lessonia rufa</i>		1956b 1962c	30 Apr. 6 Dec.-1 Jan.	×	
<i>Ochthoeca oenanthoides</i>		1956b 1962c	22 Feb. 8-31 Dec.	×	
<i>Cnemarchus (=Xolmis?) rufipennis</i>		1962c	10 Dec.		
<i>Tachuris rubigastera</i>		1956b	25 Jan.	×	
Hirundinidae	<i>Notiochelidon murina</i>	1956a	None given		
	<i>Petrochelidon andecola</i>			×	
Troglodytidae	<i>Troglodytes musculus (=aedon?)</i>	1956b 1962c	2, 18 Feb. 26 Dec.-13 Jan.		
	<i>Turdus chiguanco</i>	1957a 1962c	11 Sept. 23 Nov.-20 Jan.		
Motacillidae	<i>Anthus correndera</i>	1956b 1962c	17 Feb. 21 Dec.-18 Jan.		
	<i>A. furcatus</i>	1956b	21 Jan.		

TABLE 1. Continued.

Family	Species ^a	Dorst reference	Dorst date	This study (6-17 June)
Icteridae	<i>Agelaius thilius</i>	1956b 1962c	19 Jan.-17 Feb. 21 Dec.-17 Jan.	×
Fringillidae	<i>Catamenia inornata</i>	1962c	11 Dec.	×
	<i>Sicalis uropygialis</i>	1956b 1962c	8 Feb. 12 Dec.-19 Jan.	×
	<i>Diuca speculifera</i>	1956a	None given	
	<i>Phrygilus gayi</i>	1956b 1962c	2-20 Feb. 18 Dec.-5 Jan.	×
	<i>P. fruticeti</i>	1962c	20 Jan.	
	<i>P. plebejus</i>	1956b 1962c	9 Jan.-17 Feb. 23 Nov.-20 Jan.	×
	<i>P. alaudinus</i>	1956b 1962c	19 Jan.-21 Feb. 18 Dec.-17 Jan.	×
	<i>Zonotrichia capensis</i>	1956b 1962c	19 Jan.-6 Feb. 22 Nov.-21 Jan.	×
	<i>Spinus crassirostris</i>	1962c	9 Dec.	
	<i>S. atratus</i>	1957a 1962c	25 May 27 Dec.-20 Jan.	

^a Nomenclature follows Meyer de Schauensee (1970).

species as we encountered them. These descriptions were compared to those given in Koeppke (1970), which we carried in the field, and later to Meyer de Schauensee (1970), whose species nomenclature we followed. We were assisted in confirming species identification through the courtesy of Dr. Hernando de Macedo-Ruiz, who gave us free access to his ornithological collection at the Museo de Historia Natural "Javier Prado" in Lima.

SPECIES LIST

In none of his publications does Dorst give a species list *per se*. Also, it is not always clear where each species was recorded. Where the locations are clear, we do not include records from Lake Titicaca or the Province of Macusani, as they may not be representative of the puna at Checayani. We have included records (Table 1) from within the Province of Azángaro only (Putina, Muñani, Checayani, Azángaro, and Yanakeara). The reader is referred to accounts by Morrison (1939, 1948a, b) for puna species elsewhere, many of which have not yet been recorded in the Province of Azángaro. We suspect that this is at least partly because few ornithologists have visited the area. Dorst (1956b; 1963), however, considers the avifauna of the Checayani area to be impoverished.

Some interpolation from Dorst's publications was necessary. Some species had no specific name attached (e.g. *Petrochelidon*, Dorst 1956a); others had no description of where or if they were observed and appeared to be hypothetical for the area (e.g. *Vultur gryphus*, *Fulica ardesiaca*, Dorst 1956a). Some were collected during the dry season (e.g. *Bolborhynchus aurifrons*, Dorst 1956b) and sent to Dorst in Paris.

SELECTED SPECIES ACCOUNTS

Podiceps rolland. White-tufted Grebe.—An adult was observed on 14 June with one chick estimated to be about 10 days old.

Phalacrocorax olivaceus. Neotropic Cormorant.—A nesting colony on a reed island in Lago Jesollani contained 80 young, which were adult-sized and appeared near fledging on 7 June. The colony was interspersed with several nests of *Plegadis ridgwayi* and extended along approximately 30 m of the edge

of the reed island. Dorst (1956a) records nesting in early February, when most nests in a colony were empty but some had incomplete clutches of one or two eggs.

Plegadis ridgwayi. Puna Ibis.—Several nests were interspersed with those of *Phalacrocorax olivaceus* in a reed-bed colony. Young were well-developed, but no age estimation was possible.

Anas flavirostris. Speckled Teal.—We observed a display behavior. Several individuals in a group of nine would raise themselves out of the water ("standing up") and tuck the bill down into the breast. This was accompanied by rapid swimming in circles, moving the head and bill up and down, and whistling with a one- or two-note peep.

Oxyura sp.—Exhibiting identical behavior amongst a group of Ruddy Ducks (*Oxyura jamaicensis ferruginea*) was an individual with an all-white head, reminiscent of the Eurasian White-headed Duck (*Oxyura leucocephala*). The individual was observed twice, once in the company of three stiftail females. It was identical in plumage and bill color to the Ruddy Ducks with which it consorted, except for the pure white head. Unless it is representative of an aberrant plumage type of Ruddy Duck, this individual remains unspecified.

Buteo poecilochrous. Variable (or Puna) Hawk.—Two birds of this species had been tamed by our host, Ing. Humfredo de Macedo-Ruiz, and remained free-flying around the hacienda. These birds rarely appeared to interact but screamed continuously in late afternoon and early evening. They were fed on scraps thrown onto the hacienda roof, and they roosted on chimneys. A Bare-faced Ground-Dove (*Metriopelia ceciliae*) was chased by one of the hawks and flew into a window. Rees retrieved it in a stunned condition. After being examined and released, the dove flew unsteadily to a ledge on one of the hacienda walls. The hawk that had previously pursued it attacked again, grabbing the dove and flying off immediately with its catch. Bare-faced Ground-Doves were numerous around the hacienda buildings and were probably a regular prey item of the Variable Hawk. Other items that have been recorded in the latter's diet are the Spotted Nothura (*Nothura maculosa*) and the small rodents *Akodon boliviensis*, *Phyllotis pictus*, and *Hesperomys* sp. (Dorst 1956a, Macedo 1964).

Falco sparverius. American Kestrel.—Two birds were regularly seen perching on derelict buildings near the hacienda. At the foot of one perch, we retrieved the remains of small rodents (either *Akodon* sp. or *Phyllotis* sp.) and several skulls of the lizard *Liolaemus multiformis*. One bird was seen flying into a hole under the eaves of one of the hacienda buildings where it may have roosted or perhaps nested.

Gallinula chloropus. Common Gallinule.—An adult with three nearly full-grown young was observed at Lago Jesollani on 14 June.

Fulica americana. American Coot.—At Lago Jesollani we observed two broods containing two and three newly hatched young on 7 June. Adults were numerous at this lake, calling in low or aspirated grunts that were given either singly or in sequence. Agonistic behavior was much the same as in North American individuals: low stretch with neck parallel to the water, followed by wings high accompanied by much chasing.

Fulica gigantea. Giant Coot.—A pair with four young a few days old was seen on 7 June, and another pair with five downy young was seen on 14 June. Fledged juveniles were also seen. Juvenal plumage was grey on the back and dirty whitish on the front and neck and appeared to be very much lighter than the plumage of the dark parents. An adult was seen pulling weeds onto a nest island on 7 June. We counted at least seven nest mounds on Lago Jesollani. Dorst (1956a) says that January–February is apparently not part of the breeding season, and this is supported by our observations. Morrison (1939), however, records 2 pairs, each with 1 young, about 3 weeks old and two-thirds grown, respectively, on 9–12 November, and McFarlane (1975) states that reproduction may occur throughout the year, although most is concentrated in the austral spring. He also states that the species is "usually, and perhaps always, found on lakes and ponds that lack emergent vegetation." This is clearly not the case at Lago Jesollani, where a large reed bed occupies the center of the lake and perhaps half of its area. No reeds or other emergent vegetation were present along the shoreline, which was heavily grazed by domestic animals. The coots did not appear unduly disturbed by our presence in full view.

Tringa melanoleuca. Greater Yellowlegs.—Our observation of one bird on 14 June appears to be unusual and noteworthy, given the traditional timing of North American shorebird migration. This species normally breeds by May throughout much of central and southern Canada. Short and Morony (1969) also report a summer record near Cerro de Pasco on 22 August. Also, large concentrations of shorebird species that breed in North America have been observed at Paracas (coastal Peru) during the northern summer; these could be first-year birds or non-breeders (J. P. O'Neill, pers. comm.).

Metriopelia ceciliae. Bare-faced Ground-Dove.—This species was numerous around the hacienda, using holes in the walls and roosting under canopies and eaves. We observed courtship and agonistic behavior but did not find any nests.

Metriopelia aymara. Golden-spotted Ground-Dove.—This species was the least common of the three Columbidae observed. On 11 June, we found a nest under a tuft of bunch grass in a "peaty" stream bed marsh. The nest was on the ground approximately 1.1 m above the stream bed. It was a shallow depression lined with a few blades of grass. It contained two white eggs, each 23×17 mm in size. Goodwin (1967) states that there is no information on the nesting of this species, although Johnson (1967) records a nest found on 8 April in the Arica district of Chile. Eggs in this nest measured 30.1×22.1 mm, and 30.7×22.2 mm, substantially larger than the eggs we found. Our record is apparently the first nest description for Peru, and the egg-size difference leads us to suspect that considerable variation in size occurs.

Metriopelia melanoptera. Black-winged Ground-Dove.—On 14 June, we found one bird sitting on a nest in a *Puya raimondii*. Two dead young had apparently been built into the nest structure. Six nests were found 2 m above ground level in a small stand of queñoa trees (*Polylepis* sp.) in an arroyo. These were bulky platforms of sticks; one of them contained two white eggs measuring 26×20 mm and 28×21 mm.

Bolborhynchus orbynesius. Andean Parakeet.—On 6 June, we observed two birds perched in shrubbery on rocks overhanging an arroyo. On 8 June, six were perched on a wall at the hacienda. This species does not appear to have been previously recorded at Checayani.

Tyto alba. Barn Owl.—One individual was found dead, trapped in a *Puya raimondii*. Several species have been trapped thus, including birds the size of *Buteo poecilochrous* (Dorst 1957b). We discuss the significance of birds trapped in *Puya raimondii* elsewhere (Rees and Roe in press).

Uropsalis segmentata. Swallow-tailed Nightjar.—On 13 June, we observed one bird among some rocks in a ravine. The species does not appear to have been previously recorded at Checayani.

Cinclodes fuscus. Bar-winged Cinclodes.—We observed several displays of this abundant species, but were unable to interpret the displays. When chasing interactions occurred, the aggressor would come to a halt with belly and bill held in one line, crouched low, with the tail held vertically. This was often followed by the singing display, which consisted of a stream of chittering and whirring notes accompanied by wing-raising to full vertical position or simply by wing-jerking. The wing-raising exposed the broad white flashes on the underside of the wing. One bird caught a small fish or a frog from a brackish, weedy ditch.

Agriornis montana. Black-billed Shrike-Tyrant.—We observed this species capture and kill a small rodent, probably *Akodon* sp., in some derelict buildings. Dorst (1962b) mentions that this tyrant is also a predator of the hummingbird, *Oreotrochilus estella* (the Andean Hillstar), but gives no details.

Sicalis uropygialis. Bright-rumped Yellow-Finch.—An adult was observed on 10 June feeding young at a nest in a hole in a wall in the courtyard of the hacienda.

Phrygilus plebejus. Ash-breasted Sierra-Finch.—We found four nests of this species. Three were elevated approximately 20–25 cm above the ground in clumps of bunchgrass, and one was woven into a small bush in a rock crevice. The contents were as follows: 7 June—1 with 2 eggs, 1 with 1 cold egg (adults present), and 1 with 2 young less than 1 week old; 12 June—1 with 2 young estimated to be 1–2 days old. At this nest, the adult flushed from the nest appeared to be the male. The song near the nest was "eeeeeeee-chuk-eechuk," with a crescendo on the first "ee's." Vuilleumier (1969) describes two nests with eggs in the period 12–14 October in Bolivia; the nests were in *Baccharis* shrubs about 1.2 m above ground level. Dorst (1957b) records nesting in *Puya raimondii* and discusses clutch size (1963) in the species.

DISCUSSION

Combining our sightings with those of Dorst, a total of 88 species have now been recorded from the puna of the Province of Azángaro. Of these, we recorded 56 in 12 days. We have added nine species to those observed by Dorst (including two species about which there is doubt, namely a strangely plumaged *Oxyura* and *Agriornis albicauda*).

The following puna species were recorded on the puna by ourselves and on the coast by Pearson and Plenge (1974), who suggest that their records are evidence of altitudinal migration: *Podiceps rolland*, *Plegadis ridgwayi*, *Chloephaga melanoptera*, *Anas flavirostris*, *A. georgica*, *A. versicolor*, *Fulica americana*, *Vanellus resplendens*, *Larus serranus*, *Muscisaxicola alpina*, *Lessonia rufa*, and *Zonotrichia capensis*.

Pearson and Plenge (1974) also recorded *Phoenicopterus chilensis*, which we did not record, possibly because we did not visit suitable habitat. We recorded unequivocal evidence of breeding during the dry season in *Podiceps rolland* and *Plegadis ridgwayi* and in eight other species.

Of particular interest is the absence of trochilids from our list. Dorst (1956c, 1962b) maintains that they migrate altitudinally to lower regions during the austral winter when the puna cannot supply their feeding requirements. Despite frequent excursions through various habitats where Dorst (1956b, 1962b) found them nesting in fair numbers, we did not observe any trochilids. This supports Dorst's assertions.

In summary, it appears that many species remain on the puna year-round, and some of these also breed year-round. This does not negate the ideas of Pearson and Plenge (1974) and Dorst (1956a) with regard to altitudinal migration, but it does suggest that this migration is not universal and may well be restricted to certain species or certain individuals in the population.

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The **Fifth Pan African Ornithological Congress** will be held at Lilongwe, Malawi, from 23 to 30 August 1980. Persons interested in details should contact Len Gillard, Executive Secretary, 5th P.A.O.C., P.O. Box 84394, Greenside, Johannesburg 2034, South Africa.