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MIGRATORY STATUS OF THE WHITE-THROATED HAWK (*BUTEO ALBIGULA*): WHAT DO WE KNOW UP TO NOW?

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Resumen. – Status migratorio del Aguilucho Andino (*Buteo albigula*): ¿qué sabemos hasta ahora? – El Aguilucho Andino (*Buteo albigula)* es un pequeño accipítrido distribuido en los Andes en dos áreas diferentes: los bosques templados australes de Argentina y Chile (únicas áreas reproductivas conocidas), y luego de un hiato aparente, los Andes tropicales (desde el noroeste de la Argentina hasta Venezuela). La posibilidad de que la especie fuera migratoria se consideró a partir de las primeras observaciones de esta especie en la región de las Yungas argentinas. Por observaciones hechas durante 1995–2005 en el NO de la Patagonia argentina, confirmamos que los Aguiluchos Andinos son residentes reproductivos de verano. El patrón de residencia veraniego de las poblaciones del sur coincide tanto con grupos de Aguiluchos Andinos observados en Chile central migrando hacia el norte (otoño austral) y hacia el sur (primavera austral). En contraste, el estatus de residencia en las áreas tropicales es desconocido. El propósito de este trabajo es proveer nuevos registros de la migración de este aguilucho, tanto en los Andes del sur de Chile como en las Yungas argentinas, y revisar la evidencia concreta existente que sostiene las distintas hipótesis de migración de esta especie. Con los datos presentados aquí, generamos y discutimos básiccamente dos hipótesis alternativas: (1) los Aguiluchos Andinos son migradores parciales, los bosques australes no son sus únicas áreas reproductivas, y solamente las poblaciones sureñas migran luego de la reproducción, o (2) los Aguiluchos Andinos son migradores totales, la reproducción ocurre exclusivamente en el sur de Argentina y Chile, y hay posiblemente una población no reproductiva que permanece en las áreas tropicales durante la estación reproductiva de la población austral.

Abstract. – The White-throated Hawk (*Buteo albigula)* is a small Accipitridae distributed in South America in two different Andean areas: the southern temperate forests of Argentina and Chile (only known breeding areas), and after an apparent gap, the tropical Andes (from northwestern Argentina north to Venezuela). With the first observations of this species in the Argentine Yungas region, the possibility of it being migratory was considered. Through observations made from 1995–2005 in NW Argentine Patagonia, we confirmed that the White-throated Hawks are summer breeding residents. The summer residency pattern of the southern populations coincided both with flocks of White-throated Hawks seen migrating north (austral autumn) and southwards (austral spring) in central Chile. In contrast, the residency status in tropical areas is unknown. The purpose of this work is to provide new records of this hawk's migration, both in southern Chilean Andes and in the Argentine Yungas, and to review the concrete existing evidence that supports the different migration hypotheses for this species. With the facts presented herein, we generate and discuss basically two alternative hipotheses: (1) White-throated Hawks are partial migrants, the austral forests are not their unique breeding grounds, and only the southern populations migrate after breeding,

or (2) White-throated Hawks are total migrants, breeding occurs exclusively in southern Argentina and Chile, and there is possibly a non-breeding population that remains in the tropical areas during the breeding season of the austral population. *Accepted 30 August 2006*.

Key words: Migration, *Buteo albigula*, White-trhroated Hawk, Argentina, Chile.

INTRODUCTION

The White-throated Hawk (*Buteo albigula)* is a small Accipitridae (40 cm and 500–600 g) distributed in South America. Based on a specimen captured in Valdivia, Southern Chile, Philippi first described this species as *Buteo albigula* in 1899. However, its taxonomic status has been subject of great controversy, since it had been considered as a subspecies of the Short-tailed Hawk (*Buteo brachyurus*) (Brown & Amadon 1968, Rand 1960), and even as a juvenile of the Red-backed Hawk (*B. polyosoma*) (Philippi B. 1942) or of the Broad-winged Hawk (*B. platypterus*; Goodall *et al.* 1951). Finally, through the work of Stresemann (1959), it was reconsidered as a valid species and it appears as such in recent literature (Bierregaard 1994, Ferguson-Lees & Christie 2001).

This species' distribution is another cause of confusion. Considering infrequent observations and captures, present evidence indicates two areas of distribution: the southern temperate forests of Argentina and Chile (at lower latitudes in the latter) and, after an apparent gap, the tropical Andes (from northwestern Argentina, through Bolivia, Perú, Ecuador and Colombia, to Venezuela). In the 1970's, with the first observations of the White-throated Hawk in the yunga region of Tucumán and Salta provinces (Hoy 1969; Olrog 1972, 1979, 1985), the possibility of it being migratory was considered. Casas & Gelain (1995) reinforced this view through their analyses of numerous observations of the species in southern Argentina, all in spring and summer. The observations of migrating groups of hawks in central Chile, going south in spring and north in autumn, presented by Pavez (2000) confirmed this possibility. Curiously, some recent books have not included this evidence, considering the species as resident in its whole distribution range(Ferguson-Lees & Christie, 2001).

The purpose of this work is to provide two new watchsites of the White-throated Hawk, both in Chile and Argentina. We also review the the concrete existing evidence that supports the different possible migration hypotheses for this species: (1) White-throated Hawks are partial migrants, the austral forests are not their unique breeding grounds, and only the southern populations migrate after breeding, or (2) White-throated Hawks are total migrants, breeding occurs exclusively in southern Argentina and Chile, and there is possibly a non-breeding population (probably immatures) that remains in the tropical areas during the breeding season of the austral population.

METHODS

Field observations were made in two areas, one in southern Chile, and the other in northeastern Argentina (Fig. 1).

The migration watchsite in Chile is located in the southern Andes, in the boundary between Las Nalcas and Malalcahuello National Reserves (38º24'S, 71º32'W), in the eastern slope of Lonquimay Volcan (2865 m). The area lacks vegetation due to a relatively recent volcanic eruption (25 December 1988) which has left the mountain slopes covered with lava, part of which has turned into fine gravel. The valleys at the foot of the volcan

FIG. 1. Breeding area of White-throated Hawks in Argentina and Chile with an hypothetical migratory route along the Andes and Aconquija mountains. Lonquimay Volcan and Tafí del Valle are migratory watchsites where the hawks pass though northern territories in autumn.

are covered with evergreen forests of araucarias (*Araucaria araucana)*, partially burnt by the volcanic activity.

The other observations took place in Tafí del Valle (26º52'S, 64º41'W, 2000 m), Tucumán Province, in the Yungas of Argentina. This valley is located where the Aconquija and the Cumbres Calchaquíes mountains meet. The surrounding hills have a maximum height of 4600 m, and the vegetation consists of open areas with short grass and bushes, gardens and cultivated fields at lower altitude, montane forest with alder (*Alnus acuminata)* and queñua (*Polylepis australis*) between 2000 and 3000 m, and bunch-grass (*Festuca hieronymeus*) and puna grassland (mostly *Festuca ortophyla*) between 3000 and 4500 m.

We also carried out a review of the available literature on sightings and study skins of the White-throated hawk to determine its residency and breeding status in its northern Andean range.

RESULTS AND DISCUSSION

Field observations

Over the last years, the authors of this paper have detected migrating hawks in two new areas, one in Chile, the other in Argentina. Observations were made opportunistically, and consequently we did not follow a standard sampling protocol.

Southern Chile watchsite. Two observations have been made in two consecutive years. The 9 April 2004 was a sunny day, with a northwestern breeze and good visibility. The observations of this day lasted 1 h (13:00–14:00 h). In the early afternoon, on the northeastern slope of Lonquimay Volcan (which had an active secondary chimney), hawks were seen coming from the south at high altitude. They arrived low at Lonquimay Volcan, gained height on thermals over the fumarole and headed north. Four groups of hawks were observed to pass through this site (Table 1). A Peregrine Falcon (*Falco peregrinus*) and a Red-backed Hawk were also observed but remained in the area instead of taking the almost identical flight path of the other hawks.

The 11 April 2005 was cloudy until 16:00 h, with strong, cold south wind. The rest of the day was sunny and calm. This time, the site was observed all day long (09:30–18:00 h). The activity started at 14:00 h; we observed a total of 14 White-throated Hawks, 15 Red-backed Hawks (11 common phase and four dark phase), and six unidentified buteos (which, according to their size, could have been Rufous-tailed Hawks), all headed north

TABLE 1. Observations of groups of migrating hawks in Lonquimay watchsite (Chile) in April 2004 and 2005. All hawks were observed migrating from south to north. WTH: White-throated Hawks (*Buteo albigula*); B: unidentified Buteo; RBH: Red-backed Hawks (*Buteo polyosoma*); RTH: Rufous-tailed Hawks (*Buteo ventralis*); C: common color phase; D: dark phase.

Date	Groups	WTH observed	Other hawks observed
9-04-04	1	3	6 RTH
9-04-04	2	6	–
9-04-04	3	1	2 RTH
9-04-04	4	11	–
Total	WTH	21	
11-04-05	1	3	6 B, 3 RBH(C)
11-04-05	2	2	1 RBH(D)
11-04-05	3	2	1 RBH(D)
11-04-05	4	1	2 RBH C)
11-04-05	5	1	5 RBH(C), 1 RBH(D)
11-04-05	6	1	1 RBH (C)
11-04-05	7	4	1 RBH (C)
Total	WTH	14	

(Table 1). In presence of strong winds, they travelled by fast, unidirectional flapping flight, at approximately 100 m altitude; when the wind calmed down and the sun came out, they were seen riding thermals to gain height in the exact same way as observed in 2004.

Northeastern Argentina watchsite. On 30 August 2002, several dozens of White-throated Hawks were seen flying south through Paraje El Infiernillo (2800–3000 m), situated in the northern end of the valley. They were seen feeding on Ornate Tinamous (*Nothoprocta ornata*), which are very abundant in the valley in that season. Their migration through Quebrada del Portugués, in the southwestern end of the valley, was observed between 15 and 25 April 2003. No regular daily counts were made, except one 1-h visit by car to check if they were still passing by. On 16 April, a total of 40 hawks were counted in a 10-km stretch at that site, a steep valley with high *Festuca* grassland and alder forest. One individual was seen feeding on an Andean Tinamou (*Nothoprocta pentlandii*). On 17 April, four hawks were observed coming through the Quebrada in the afternoon (17:00–18:00 h). On 19, 21, and 25 April, only solitary White-throated Hawks were seen passing through the valley. Some specimens stayed in the area between April and August (non-breeding season, Trejo *et al.* 2004), especially in the high mountains with deep canyons and valleys, where the open alder forest and queñua woods alternate with grassy slopes. During that season, they were seen chasing Andean Flickers (*Colaptes rupicola*) which form small groups during the winter, and Chiguanco Thrushes (*Turdus chiguanco*). Several specimens were observed on July 2004 at La Ciénaga Grande, in the Cumbres de Tafi, northeast of Tafi del Valle (3000 m). Four Short-tailed Hawks were also seen during that time at La Ciénaga, situated at 2000 m .

The two watchsites described in this paper are differently used by hawks. While the Lonquimay Volcan is just a transit zone (although it might overlap with breeding sites) for hawks who nest further south, in the Argentine Yungas, at least some hawks seem to overwinter.

Population of the southern temperate forests. As far as we know, the only nesting records known for this species were reported from the southern temperate forest of Argentina (41°08'S, 71°12'W, Gelain *et al.* 2001, Trejo *et al.* 2001, 2004) and Chile (Pavez *et al.* 2004), between latitudes 33° and 41°S. There is one nesting record further north in Chile, at 30°25'S, 71°50'W (Goodall *et al.* 1951), which has been considered doubtful by Pavez (2004) with whom we agree. The southern temperate forests in Chile extend from Río Maule (35°S) to Tierra del Fuego (55°S), and in Argentina,

TABLE 2. Records of migrating White-throated Hawks (*Buteo albigula*) in Argentina and Chile. NR: not recorded.

Locality	Coordinates	Direction	Date	Number of hawks	Hours of observation	Passage rate (hawks/h)	Sources
Valle del Tafí, Tucumán, Argentina	26°52'S, 64°41'W	N-S	30 August 2002	NR	NR	NR	This study
Valle del Tafí, Tucumán, Argentina	26°52'S, 64°41'W	S-N	15-25 April 2003	NR	NR	NR	This study
Volcán Lonquimay, Chile	38°24'S, 71°32'W	S-N	9 April 2004	21	1	21	This study
Volcán Lonquimay, Chile	38°24'S, 71°32'W	S-N	11 April 2005	14	8.5	3.5	This study
San Carlos de Apoquindo, Chile	33°24'S, 70°28'W	N-S	2-9 October 1987-1988	35	393.5	0.7	Pavez (2000)
Farellones, Chile	33°22'S, 70°21'W	S-N	21-27 March 1997-1998	256	236	4.3	Pavez (2000)

TABLE 3. Skins of White-throated Hawks (*Buteo albigula*) obtained in different South American countries.

Date	Sex	Age	Locality	Sources
11 May 1960	Male	Adult	Cuaré, Cauca, Colombia	Lehmann & Haffer (1960)
5 June 1944	Female	Juvenile	Peñablanca, Popayán, Colombia	Lehmann & Haffer (1960)
4 July 1941	Female	Juvenile	Munchique, Tambo, Colombia	Lehmann & Haffer (1960)
14 November 1939	Male	Juvenile	Munchique, Tambo, Colombia	Lehmann & Haffer (1960)
13 May 1869	Female	Juvenile	Tinto, SE Cuzco, Perú	Stresemann (1959)
18 May 1911	Male	Adult	Paso Quindio, Valle del Cauca, Colombia	Stresemann (1959)
4 July 1926	Male	Adult	Taulis, NE Pacasmayo, Perú	Stresemann (1959)
5 October 1927	Female	Adult	Escorial, Mérida, Venezuela	Stresemann (1959)
5 December 1927	Female	Juvenile	Culata, Mérida, Venezuela	Stresemann (1959)

along the Andes, bordering the Patagonian steppe. The sclerophyllous forest (Armesto *et al.* 1995), with *Peumus boldus* and *Quillaya saponaria* xerofitic woodlands, lies in the transition zone between the temperate forest and the semiarid area of northern Chile (30–34ºS). The continuity between these forests implies that the species breeds in the whole Andean area (both Chilean and Argentine), south of latitude 30º. At present, the southernmost known breeding localities are Aysén (44º05'S, 2º17'W; Figueroa *et al.* 2002) for Chile, and Los Glaciares National Park (50º02'S, 73º06'W; Imberti 2005) for Argentina.

Migratory movements of the population in its breeding area. Observations made over 10 years in the surroundings of Bariloche (Fig. 1, 41º08'S, 71º12'W), in the Nahuel Huapi lake region, northwestern Argentine Patagonia (e.g., see Gelain *et al.* 2001) indicate that the southern population is migratory, arriving in September–October, and leaving at the beginning of April. The earliest known sighting is from 13 September 1978 (Casas & Gelain 1995), even though this hawk is more often seen after October. This data coincides with the observations of Pavez (2000) in central Chile who saw groups of individuals migrating south in spring and north in autumn (Table 2).

Analyzing the recorded dates in the different migration watchsites (Table 2), and the arrival and departure dates in our study area in the surroundings of Nahuel Huapi lake, we believe that the whole population breeding in Argentina and Chile migrates north at the beginning of autumn and comes back at the beginning of spring. However, three records are questionable under this assumption. One of them is a dark specimen captured at Orán (Yungas of northern Argentina; see Höy 1969) in January 1969. Although we did not have access to this specimen, its description does not match the typical description for White-throated Hawks (Navas & Manghi 1991, Ojeda *et al.* 2003). The existence of dark phases in this species is doubtful (Ferguson-Lees &Christie 2001, Bierregaard 1994). The other two sightings happened on 3 May 2001 (a little after any known record of White-throated Hawks in the forests), at the Chilean locality of Aysen (Figueroa *et al.* 2002), and on 13 July 1987, at the Nahuel Huapi lake area (Casas & Gelain 1995). These records are difficult to fit into a pattern of autumn migration of the whole breeding population, although it could be due to a stray (in the first case, misidentification doubtful due to a very close observation), or a misidentification (in the second case, an individual flying at a high altitude, M. Gelain pers. com.).

Situation in the tropical and subtropical Andes. Except for the migratory population that breeds in southern Argentina-Chile, all other sightings correspond to the tropical and subtropical Andes. According to all the consulted authors, the White-throated Hawk is distributed where montane forests meet hight altitude grasslands at approximately 2000–3500 m (Fjelså & Krabbe 1990, Thiollay 1996, among others), although they have been observed at lower altitudes (1600 m, I. Roesler pers. com.). This same habitat (represented by the high forest in contact with the high pastures), at a lower altitude, is used by the hawks for nesting in the southern temperate forest (Trejo *et al.* 2004).

The first question to arise is: Does the White-throated Hawk breeds only in southern Argentina and Chile or all-over its distribution range? Published information does not provide any answer, since every source (Bolivia, Arribas *et al.* 1995, Kempff Mercado 1985; Perú, Clements & Shany 2001, Walker 2002; Ecuador, Ridgely & Greenfield 2001; Venezuela, Phelps & Meyer de Schauensee 1978; Colombia, Hilty & Brown 1986, Salaman *et al.* 2001) shows records of this hawk but nothing on whether it is migratory or res-

ident. The exception is the work by Hennessey *et al.* (2003) which considers this hawk a probable austral migrant in Bolivia. Therefore, its status in the rest of its distribution range is unknown. Ridgley & Greenfield (2001) consider the southern temperate forest as being the only nesting area. However, N. Krabbe (pers. com.) believes that Ecuador has resident populations since the species has been observed year round. He admits, nevertheless, that many individuals may have been misidentified.

Most study skins (see review by Stresemann 1959, and Lehmann & Haffer 1960) from northern South America were collected between May and September (i.e., the austral winter), which is in accordance with considering this area as a wintering ground for the species. However, records from Venezuela and Colombia, in November and December (Table 3), make the residency status of the White-throated Hawk in the northern Andes at least uncertain. In addition to this, Bildstein (2004) classified this species as a partial migrant, i.e., < 90% of all individuals migrate, also undertaking altitudinal migration, breeding in the high Andes and migrating to lower elevations at other times of the year. However, this statement is based on recently published general raptor information and there is no concrete evidence to support it (e.g., Fjeldså & Krabbe 1990, Bierregaard 1994, Ferguson-Lees & Christie 2001).

According to the evidence presented here, we believe that the whole southern breeding population is migratory, even though some individuals may stay in the breeding areas for some time after the nesting period (as suggested by the record in Aysén). Then, there are two possibilities: a) the species is a total migrant, and the only breeding grounds are the southern temperate forests of Argentina and Chile, and b) the species is a partial migrant. Only the southern breeding population migrates north in the autumn, and there are breeding populations yet undiscovered in the tropical and subtropical Andes. The lack of breeding records in other parts of the species distribution may be due to the difficulty of finding nests of a rare raptor in the high Andean forests, and then it would be only a matter of time and effort to find them. The presence of immatures all year at least in some parts of the range (as Tucumán) sustain the hypothesis that, even being a total migrant species, immatures may over-summer during their first or more years in their wintering areas. This could explain the anomalous sightings in Colombia and Venezuela, since they were juveniles in both cases. However, this presence also could be explained in a partial migration scenario and could be reflecting the presence of breeding populations in the northern Andes.

The present lack of knowledge of this Neotropical raptor requires satellite tracking as well as the combined work of ornithologists and birdwatchers in the Andes to carry out annual observations and enhance the search for nests. The White throated Hawk's habitats, the Andean rainforests and the high Andean grasslands, are considered to have the richest birdlife of the world, but also the most threatened (Bierregaard 1998, Bierregaard *et al.* 1992).

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