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Distribution and geographical variation of the White-tailed Hawk *(Buteo albicaudatus)*

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ABSTRACT

The present knowledge on infraspecific variation, distribution, and migration of the White-tailed Hawk (*Buteo albicaudatus* Vieillot) is critically reviewed. In practically every aspect knowledge is highly inadequate. Size variation (tables I—IV) is in accordance with Bergmann's Phenomenon, but does not seem to form a sound basis for the current recognition of three subspecies. Intermixture of resident tropical populations (with relatively small dimensions) with migrants from the north and/or south is suspected.

INTRODUCTION

This study was prompted by the collecting of a specimen of White-tailed Hawk (*Buteo albicaudatus* Vieillot) in Surinam (Netherlands Guiana) on 17 August 1961, with dimensions larger than expected for the race *colonus* to which the Surinam breeding population is inexceptionally ascribed (Haverschmidt, 1955). As the White-tailed Hawk has a wide, but apparently highly discontinuous range in North and South America, occurring from southern Texas in the north, to Rio Negro, Argentina, in the south (Olrog, 1963), a re-consideration of the actual breeding range and the geographical variation involved seemed worthwhile.

Buteo albicaudatus is currently split up into three geographical races as follows:

B. a. hypospodius Gurney, a rather light coloured and large inhabitant of the southern United States, Mexico and Central America.

B. a. colonus Berlepsch, a small inhabitant of tropical northern South America.

B. a. albicaudatus Vieillot, a rather dark coloured and large inhabitant of subtropical South America.

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There has been some confusion as to the occurrence of these races in northwestern South America. According to Meyer de Schauensee (1964) *B. a. hypospodius* occurs in Colombia in the upper tropical and subtropical zones west of the Andes, whereas *B. a. colonus* should be confined to areas east of the Andes and Santa Marta and the Guajira Peninsula.

In Venezuela *B. a. colonus* should occur throughout the country, except in the mountainous northwest (Zulia, Andes de Mérida) where *B. a. hypospodius* has been recorded, and the Territorio Amazonas, where this species is apparently absent (Phelps & Phelps, 1958).

Habitat

Throughout its range the habitat of *Buteo albicaudatus* is invariably described as open, dry country with sandy or slightly rocky areas, sparse vegetation, leaving patches of open soil, and usually with some kind of thorny scrub and candelabre cacti.

In the north it is described as "extensive prairies near the coast, especially about the sand ridges that are covered with yucca and cactus" (Texas, *ex* Bent, 1937 : 217).

In the tropics the species is characterized as being stenoecious and xerophilous, with a limited ecological tolerance (Caribbean coast of Venezuela, Schäfer & Phelps, 1954 : 31); whereas the habitat is described as hot rocky plateaus and low escarpments, with xerophytic vegetation, particularly acacia- and cactus-deserts (Aruba, Curaçao, and Bonaire Islands, Voous, 1957).

In southern South America the habitat is described as "terrenos albiertos" (open country) (Argentina, Olrog, 1959 : 84), but it is not a bird of the pampas, where it is replaced by *Buteo polyosoma* (Pereyra, 1937).

As a matter of fact this is only a selection of habitat descriptions throughout the White-tailed Hawk's range. But on the whole the species is little known and is mostly seen soaring high over restricted areas of warm savanna, thorn scrub, and semi-desert of whatever type. Published breeding records are extremely scarce. Apparently the species is absent as a breeding bird in well-forested areas and the breeding range seems therefore to be more discontinuous, than is usually realized, if not really scattered.

Distribution

The breeding range of *Buteo albicaudatus* is insufficiently known. Apparently the first attempt to a distribution map has been made by Grossman & Hamlet (1964 : 265), indicating a distributional gap in Brazil only. Still, it is definitely stated in various places in the literature that there are no known breeding cases in Chihuahua, Coahuila, Campeche, and Yucatan (Mexico), British Honduras, Guatemala, El Salvador, and Panama, whereas Slud (1964) could cite only one definite case of nesting in the dry forest area of western Costa Rica, where however, the species is resident. In Colombia and Venezuela the breeding range is apparently much more restricted than

is indicated on Grossman & Hamlet's map. Likewise the White-tailed Hawk has only recently been recorded from Uruguay (Cuello, 1966; though a specimen from Montevideo, collected by Sellow, in the Berlin Museum, is mentioned by Stresemann, 1925), where it is not known to nest. Nor did I find records of nests or young from Brazil and Paraguay; whereas Wetmore (1926), who travelled in northern Argentina, Paraguay, Uruguay, and Chile from June 1920 to April 1921, did not meet with a single bird of this species. Other countries from which records have been published are: Ecuador, Bolivia, and Chile(?).

Maps

Present knowledge on *Buteo albicaudatus* does not allow the drawing of an accurate distribution map. Grossman & Hamlet's (1964) tentative map (figure 1) is therefore only taken to make a comparison with a simplified vegetation map derived from Smith & Johnston (1945) (figure 2). In view of the bird's preference for open, non-forested habitats, it is clear, that some kind of discontinuity in breeding range caused by the wide expanse of subtropical and tropical forests is unavoidable.

Figure 1. Distribution map, after Grossman & Hamlet (1965 : 265); to be compared with figure 2.

FIGURE 2. Distribution of forested and non-forested areas. The non-forested areas include (*black*): the South Brazilian forest and savanna zone, savanna, thorn forest, desert scrub, Pampean grassland, and California chaparral; (*stippled*): North American plains, coastal deserts of Pacific South America, and Patagonian Fuegian steppe. Adopted from the phytogeographic map of Latin America by Smith & Johnston (1964 : 12—13).

Figure 3 shows the localities where specimens have been collected, plotted on a large-scale map of non-forested habitats considered suitable from a human point of view, to meet the bird's ecological requirements. Although a great conformity is clearly shown, it may be, that patches of open, dry country amidst or above mainly forested areas are accepted as nesting sites, such as favourably situated rocky slopes or low escarpments, locally in Panama, where the species is considered resident, though not yet found breeding (Wetmore, 1965).

Other records in seemingly unsuitable habitats may indicate migration movements (see below).

DIMENSIONS

Size, expressed by the length of wing and tail, is generally mentioned as one of the main characters of the White-tailed Hawk's geographical variation. The author measured 145 specimens; the results of which have been arranged in tables I—VII. The following conclusions seem to be valid.

FIGURE 3. Localities from which specimens of *Buteo albicaudatus* have been examined and additional collecting localities of specimens in South American and a few other collections (*black spots*). Shaded: subtropical and tropical non-forested areas.

1. Females are larger than males. In corresponding plumages wing and tail are at the average about 8% longer in females than in males (tables I—IV).
2. Juvenile, immature, and adult birds do not differ in wing length (table V).
3. Juvenile and immature birds have a longer tail than adult birds in grey plumage, exceeding the latter by at the average about 15% (table V).

   Young birds, which by their dark brown plumage already differ so conspicuously from the grey-and-white adults, show in flight a decidedly longer tail and therefore have a markedly different silhouette.
4. The geographical variation in wing and tail length follows Bergmann's Phenomenon (Bergmann's "rule"), tropical birds being noticeably smaller (tables VI—VII).
5. Birds from subtropical North and Central America and from subtropical South America do not show appreciable differences in the lengths of wing and tail.

TABLE I. Wing length of *Buteo albicaudatus* (grey, adult plumage)

	males			females			
	number of specimens	variation	mean	number of specimens	variation	mean	excess of mean[1])
Texas	9	410—447	424	6	433—457	447	5%
Mexico	6	411—432	421	1	456	456	8%
Central America	1	427	427	3	442—452	447	5%
Colombia	3	405—425	412	2	445—455	450	9%
Venezuela	9	374—410	397	5	417—428	422	6%
Netherlands Antilles[2])	2	368—385	376	—	—	—	—
Guiana	5	397—410	403	6	430—451	440	7%
Brazil[3])	8	374—447	418	2	480—484	482	15%
Brazil (Matto Grosso)	2	415—424	419	2	437—450	443	6%
Paraguay	6	408—425	420	11	440—470	454	8%
Argentina	1	425	425	1	485	485	14%
					Average excess of mean of females		8%

[1]) Mean wing length of females exceeding mean wing length of males in percentage of male mean.
[2]) Aruba, Curaçao, Bonaire.
[3]) Excepting Matto Grosso.

TABLE II. Wing length of *Buteo albicaudatus* (brown, juvenile plumage)

	males			females			
	number of specimens	variation	mean	number of specimens	variation	mean	excess of mean[1])
Texas	2	414—426	420	1	451	451	7%
Mexico	2	430—438	434	1	468	468	8%
Central America	2	412—425	418	2	454—455	454	9%
Colombia	1	419	419	1	461	461	10%
Venezuela	—	—	—	5	428—441	434	—
Netherlands Antilles[2])	2	362—378	370	3	385—387	386	5%
Guiana	4	394—429	425	2	420—447	433	2%
Brazil[3])	1	418	418	2	443—455	449	7%
Brazil (Matto Grosso)	4	414—438	421	2	438—455	446	6%
Paraguay	1	428	428	1	440	440	3%
Argentina	2	406—424	415	2	430—453	441	6%
					Average excess of mean of females		6%

[1]) [2]) [3]) see table I.

TABLE III. Tail length of *Buteo albicaudatus* (grey, adult plumage)

	males			females			
	number of specimens	variation	mean	number of specimens	variation	mean	excess of mean[1])
Texas	7	164—192	178	3	182—188	185	5%
Mexico	5	159—186	170	1	201	201	17%
Central America	1	177	177	1	178	178	1%
Colombia	3	155—170	162	1	169	169	4%
Venezuela	9	141—163	153	4	148—165	156	2%
Netherlands Antilles[2])	2	165—169	167	—	—	—	—
Guiana	5	157—165	162	6	160—186	170	5%
Brazil[3])	4	153—175	165	1	198	198	20%
Brazil (Matto Grosso)	2	163—172	167	2	182—193	187	12%
Paraguay	6	161—177	170	11	180—201	193	13%
Argentina	1	169	169	1	207	207	22%
					Average excess of mean of females		10%

[1]) [2]) [3]) see table I.

TABLE IV. Tail length of *Buteo albicaudatus* (brown, juvenile plumage)

	males			females			
	number of specimens	variation	mean	number of specimens	variation	mean	excess of mean[1])
Texas	2	204—209	206	1	215	215	4%
Mexico	2	172—230	201	1	219	219	9%
Central America	2	204—207	205	2	195—220	207	1%
Colombia	1	206	206	1	196	196	—5%
Venezuela	—	—	—	5	173—211	188	—
Netherlands Antilles[2])	2	186—190	188	3	195—198	197	5%
Guiana	4	180—202	190	2	205—215	210	12%
Brazil[3])	1	168	168	2	209—234	221	32%
Brazil (Matto Grosso)	4	178—195	185	2	208—223	215	16%
Paraguay	1	209	209	1	216	216	3%
Argentina	2	191—206	198	2	188—200	194	—2%
					Average excess of mean of females		8%

[1]) [2]) [3]) see table I.

TABLE v. Excess of mean of wing and tail length of juvenile birds in comparison to adult birds (in percentage of mean of adult birds)

locality	wing		tail	
	males	females	males	females
Texas	—1%	1%	16%	16%
Mexico	3%	3%	18%	9%
Central America	—2%	2%	16%	16%
Colombia	2%	2%	27%	16%
Venezuela	—	3%	—	21%
Netherlands Antilles[1])	—2%	—	13%	—
Guiana	5%	—2%	17%	24%
Brazil[2])	0%	—7%	2%	12%
Brazil (Matto Grosso)	0%	1%	11%	15%
Paraguay	2%	—3%	23%	12%
Argentina	2%	—9%	17%	—6%
average	1%	—1%	16%	14%

average excess wing length 0%
average excess tail length 15%

[1]) Aruba, Curaçao, Bonaire.
[2]) excepting Matto Grosso.

Based on these facts, it is hardly possible to maintain the recognition of three subspecies, unless, as a matter of fact, there are three isolated breeding populations. But still the characters would largely overlap. Whether this overlap, as revealed in the present tables, is due to geographical differentiation, or is the result of the intermixture of resident tropical populations with migrants from north or south, or whether it must be ascribed to both, is unknown at present.

Only for the insular populations from Aruba, Curaçao, and Bonaire could racial distinction with some good reason be claimed, as these birds invariably are very small. But similarly small specimens have been collected in the Caribbean arid zone of coastal Venezuela; besides, it is unknown if occasionally (or regularly) birds from the islands wander to the mainland coast of Venezuela, which they can see at the horizon from their very nest sites, and where, incidentally, even when incubating, these birds can enjoy a magnificent view over cactus-clad slopes and the blue Caribbean.

COLOUR

Stresemann (1925) has reviewed the various colour types of *Buteo albicaudatus* in comparison to other species of sympatric South American hawks. Adult birds with saturated grey and brown colours ("melanistic" plumages) have been described by Stresemann from northern South America (Medellin, Colombia; Merida, Venezuela; British Guiana) and from Argentina (Tucuman). They are considerably rarer than the rather similar, almost uniform

TABLE VI. Summary of geographical variation of wing length (all age classes combined)

locality	males			females		
	number of specimens	variation	mean	number of specimens	variation	mean
Northern group[1])	23	410—447	424	13	433—468	451
Tropical group[2])	25	362—429	400	25	385—451	421
Southern group[3])	18	406—438	421	22	430—485	453

[1]) Texas, Mexico, Central America.
[2]) Venezuela, Netherlands Antilles, Guiana; but excepting Colombia and Brazil in order to avoid mixing up of specimens from possible different racial origin.
[3]) Matto Grosso (Brazil), Paraguay, Argentina.

TABLE VII. Summary of geographical variation of tail length

A. Brown, juvenile plumage

locality	males			females		
	number of specimens	variation	mean	number of specimens	variation	mean
Northern group[1])	6	172—230	205	4	195—200	212
Tropical group[2])	6	186—202	189	10	173—215	195
Southern group[3])	7	178—209	192	5	188—223	207

B. Grey, adult plumage

locality	males			females		
	number of specimens	variation	mean	number of specimens	variation	mean
Northern group[1])	13	159—192	175	5	178—201	187
Tropical group[2])	16	141—169	158	10	148—186	164
Southern group[3])	9	161—177	169	14	180—207	193

[1]) [2]) [3]) see table VI.

dark brown juvenile plumages. Other saturated colour types in which the adult birds are mainly uniform grey have been described and are represented in museum collections. Still another dark colour type in which the upper parts, head, and breast are blackish slate and the remaining under parts dark brown, has been recently discovered by F. Carlos Lehmann V., in Vijes, Department Valle del Cauca on the Pacific Andean slopes of Colombia, in September 1958 (in litt., with colour slides of freshly killed specimen).

Friedmann (1950) has given good plumage descriptions of birds of different ages. But his "immature" plumage in which grey on the throat is retained (instead of being white) seemed to me to occur more frequently in females than in males, the latter being the only ones in which I saw the under parts immaculate white without narrow reddish brown cross bars on the sides and flanks.

Migration

Migration of *Buteo albicaudatus* through Central America has been repeatedly observed and recorded by various authors. Most impressive is Wetmore's (1943) description of migratory flights observed near Tres Zapotes in Southern Veracruz (Mexico), March 30-April 12, during which period few to a few hundred were seen daily, passing high, soaring and spiralling, sometimes in company with other small hawks. In a later list of the birds of Veracruz the species is not even mentioned to occur (Lowery & Dalquest, 1951). The migratory movements probably have led to the erroneous generalization of the White-tailed Hawk's continuous occurrence as a breeding bird from Texas to Brazil.

Migratory movements of White-tailed Hawks in South America have been suspected, but spectacular flights have not been recorded. It is probable that at least in Paraguay the species is a non-breeding visitor.

It is not unlikely that *Buteo albicaudatus* represents a case comparable to that of *Parabuteo unicinctus*, in which also some unknown degree of mixing up of migrating populations in South America seems to occur.

The Surinam specimen mentioned in the Introduction is a female in dark brown, first year plumage. It was collected in the savannah strip of Zanderij where other juvenile birds and adults in white-bellied plumage were frequently observed soaring high overhead. It is a very large specimen: wing 447, tail 215 mm. It is darker and more fuscous brown throughout than juvenile birds from the Netherlands Antilles with which it has been compared. Most of the small feathers are in a fresh stage, but the secondaries and most of the inner wingcoverts are somewhat abraded at their tips, though none of the feathers is extremely worn. The tibial feathers are much longer and more fluffy than in the Antillean birds. It is not improbable that it is a trans-equatorial migrant from subtropical South America, though birds with similar dimensions have been collected elsewhere in northern tropical South America, including Venezuela and Colombia (where they could have been migrants from the north).

Conclusion

Present knowledge on the breeding range and the migration of *Buteo albicaudatus* is poor. Probably the range is highly discontinuous, with three widely separated breeding centres. The infraspecific variation is likewise incompletely known, but seems to conform with Bergmann's Phenomenon. The recognition of subspecies does not seem to reflect the geographical variation known at present. Birds from Texas, Mexico, and Central America (currently recognized as *B. a. hypospodius*) do not differ at all from birds from subtropical South America (*B. a. albicaudatus*) in either coloration or measurements.

Location of nesting places and ringing (preferably with coloured rings) to detect migration movements and routes seem to be methods of increasing the knowledge of this interesing species.

Particularly the extent of nesting in subtropical South America, which is more poorly known than anything else of this species, is worth to be recorded.

It is not unlikely that northern migrants penetrate far south into South America, perhaps also causing confusion in racial distinction of birds collected in Colombia and western, mountainous Venezuela. Northward migration from subtropical into tropical South America is likewise probable, but the extent of which is unknown.

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