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NOTES ON THE DISTRIBUTION AND NATURAL HISTORY OF THE SUN PARAKEET *ARATINGA SOLSTITIALIS SOLSTITIALIS*

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Resumo. Um sumario do conhecimento da Jandaia-Sol *Aratinga s. solstitialis* é apresentado. A maioria da informação é antiga. A distribuição é mais restringido que pensado mas tem possibilidades de ter duas populações. Não é certo que o especie tem sido visto na Venezuela ou Guiana Francesa apesar de alguns autores. Não há indicações que o papagaio é comum mas parece que pode ser comum en alguns lugares as vezes. Quatorze exemplares e quatro observações ao longo e perto do Rio Amazonas surgiram possibilidade de uma população isolada morando na varzea e vegetação secundaria entre Manaus e Santarém. Alguns destes exemplares são intermedios entre *A. s. solstitialis* e *A. s. jandaya*. Até o momento, dados são insuficiente para determinar se esta por causa da variação individual, intergradacao passada ou a dieta dos passaros. Investigações, incluindo uma busca para mais exemplares, serão continuadas.

Abstract. Knowledge of *Aratinga s. solstitialis* is reviewed and found to be mostly antiquated. The bird's known range, though possibly consisting of two populations, seems more restricted than previously thought with no specimens or published records unequivocally from Venezuela and French Guiana despite remarks of some previous authors. There is little indication that the birds are common. Fourteen specimens and four sight records from along or near the Rio Amazonas suggest the possibility of an isolated, resident population inhabiting varzea (flooded forest) and secondary vegetation along the lower Rio Amazonas and its tributaries. The observed intermediacy of some of the Rio Amazonas birds between *A. s. solstitialis* and *A. s. jandaya* is probably due to age-related individual variation. Investigations, including a search for more specimens, are continuing. *Accepted 12 May 1992.*

Key words: Aratinga solstitialis, *Sun Parakeet, distribution, natural history, taxonomy.*

INTRODUCTION

The Sun Parakeet (*Aratinga solstitialis*), *sensu* Sick (1984) and Pinto (1978), comprises three distinctive, allopatric taxa (Fig. 1) most often regarded as conspecific (e.g., Machado & Kawall 1975): *solstitialis*, *jandaya* and *auricapilla*. The aims of this study were to bring together the scattered data on the distribution and natural history of the little known nominate form *A. s. solstitialis*, hereafter for simplicity referred to as *solstitialis*, and so delineate subjects in need of further museum and field study.

The range of *solstitialis* has usually been given in broad terms as the Guianas and adjacent Brazil, with details varying from author to author. Only Phelps & Phelps (1958) mentioned a Venezuelan record, allegedly of Richard Schomburgk from Cerro Roraima (see results). Ridgely (1981) noted sightings from along or near the Rio Amazonas. Forshaw (1977) suggested that northwestern Amapá, Brazil, may be within the range but the bird is at present still unrecorded from Amapá (Novaes 1974, A. da Silva Faria *in litt.*). Forshaw's (1977, 1989) map showed the range extending east to the Atlantic coast of the Guianas. The only published basis for recording *solstitialis* south to and along the Rio Amazonas seems to be a specimen from Monte Alegre (Pinto 1966) and sightings cited in Ridgely (1981) and Silva & Willis (1986, see Fig. 2). Pinto (1966) noted that the Monte Alegre specimen is intermediate in colour between *solstitialis* and *jandaya* (see results for details). I paid special attention to the possibility of an intermediate population in the Monte Alegre area.

METHODS

I contacted the curators of 36 reference collections (see acknowledgements) to request registered data on any specimens of *solstitialis* and, as the study progressed, *jandaya* from the northern parts of its range. I have examined only three specimens and obtained more detailed data including photographs on twenty-nine others. A literature search for material relating to *solstitialis* has been commenced (see references below for

details). I searched for *solstitialis* in early mornings and late afternoons in the various localities shown in Fig. 3 in May 1985 (one day), May-July 1986 (16 days) and March-April 1987 (5 days). I walked along trails and across country looking and listening for the birds. I was able on some occasions to pursue the birds after hearing their calls. I wrote to some private individuals requesting any field data concerning *solstitialis*.

RESULTS

Museum material

78 specimens of *solstitialis* have been located (Appendix 1): 43 from Guyana, 2 possibly 3 from Surinam, 1 doubtfully from French Guiana and 31 from Brazil. Among 51 of them, ten localities giving more details than the country of collection have been recorded though some are imprecise (Fig. 2, 3): Quonga and nearby Annai, Guyana (27 specimens); Mazaruni district, Guyana (1); Rio Branco, Brazil (2); Rio Mahu (= R. Ireng, see Fig. 2), (4); Jalöe River, Brazil (1); Santarém, Brazil (2); Monte Alegre, Brazil (9); Amazonas, Brazil (1); Mariussú, middle Rio Parú, Pará, Brazil (2); Paröe Savanna, Surinam (*sic*) (2). The specimen with the locality 'Amazonas' may have been a captive bird, the locality indicating only the general area of origin of the species (M. Grabert, *in litt.*). The exact location of Quonga is uncertain but it is at approximately 4°10'N, 59°20'W (Snyder 1966, Stephens & Traylor 1985, Fig. 2). The Paröe Savanna is in Brazil and adjacent to the Sipaliwini Savanna, Surinam (see Stephens & Traylor 1985); here, I have cited label data from Haverschmidt's specimens, which were brought to, not collected by, him (G.F. Mees, *in litt.*). Snethlage (1914) referred to two males and four females from Monte Alegre and Erere, Brazil in the collection of the Museu Goeldi, Belém but I have been unable to determine whether they are still there. Snyder (1966) also cited Rio Mahu specimens and referred to further Guyana specimens from Pomeroon River, Pacaraima Mountains, Annai and Bartica. I have as yet located none of these with certainty (though a specimen from Annai is in the AMNH collection, New York) and Snyder herself had not located the Bartica material. I have not located any Venezuelan material or the holotype; it is probable that the species was named from a painting, perhaps of a live bird, and not a specimen (G.F. Mees, *in litt.*).

Variation

Table 1 summarizes the differences in plumage between *solstitialis* and *jandaya*. Data on eleven of the fourteen specimens from along or about the Rio Amazonas (Monte Alegre, Santarém, Mariussú, Amazonas) have been obtained. All appear to be adults. At least two (MNRJ 3469, SMNS 48781 - ? originally a captive bird) seem to be within the range of variation I would reasonably expect of *solstitialis*. Nine are intermediate between *solstitialis* and *jandaya*, especially in the dorsal colouration (pers. obs., H. Camargo, M. Katz, D. Teixeira, *in litt.*). Pinto (1966) described one of the intermediate specimens (USP 10644) as follows (translated):

. . . the specimen differs notably [from one from] Guyana, not only in the decidedly green colour (and not bright orange-yellow) of the upper part of the back and upper wing coverts, but also in the much clearer tone, nearly yellow, of the underparts, supercilia and sides of the neck with only weak tones of red.

A specimen labelled as a juvenile male from far northern Roraima in Brazil, NHMW 40.683 (Appendix), has the back and median primary

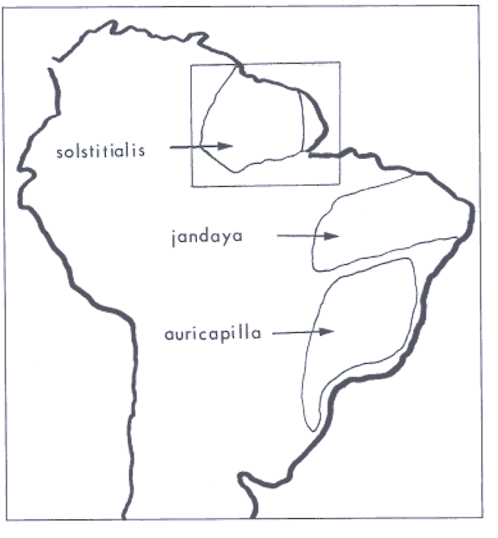

FIG. 1. Distribution of the *Aratinga solstitialis* complex based on Forshaw (1989). The enclosed region is shown in more detail in Figure 2.

coverts green; other specimens from the same locality are typical of *solstitialis* (Pelzeln 1871, H. Schifter, pers. comm.). RMNH 25098, 25597, 51048 all have the back and wing-coverts mottled green and yellow. They had been in captivity in southern Surinam and so the possibility arises of dietary factors affecting plumage colouration (G.F. Mees, *in litt.*).

Previously published data

Between 1840 and 1844, Richard Schomburgk (1848; translation in Roth 1923) while on the open plains at the confluence of the Mahu and Takutu rivers on the Brazil-Guyana border some 200 km SE of Cerro Roraima (Fig. 3), recorded an unspecified number of *solstitialis* among *Malpighia* berries though feeding was not specifically indicated. In the "forested valley of the River Cotinga near Mt Curatakie" (Fig. 3), he recorded "immense flocks of loudly shrieking golden-yellow Kessi-kessi [a local Indian name] (*Psittacus solstitialis*) [that were] flying in continuous streams alternately from the forests of the valleys and lower mountain slopes". Schomburgk (1848) indicated that this latter locality was only in the vicinity of, not at, Cerro Roraima ("und in der Umgebung des Roraima-Gebirges"). Examination of Maps 5 and 6 in Roth (1923) and modern maps of Brazil further shows that (a) the site is and, given border disputes, always was in Brazil between Boa Vista and Normandia some 130 km S of the Venezuelan border at Cerro Roraima and (b) the River Cotinga is the same river as that shown as the Rio Contigo or Rio Cotingo in modern day atlases (Fig. 3). Though mindful that the Venezuela-Guyana border has been the subject of uncertainty and dispute, I therefore conclude that Schomburgk did not record *A. solstitialis* in Venezuela at Cerro Roraima *contra* Phelps & Phelps (1958) and that the species should be removed from the Venezuelan list.

Snyder (1966) recorded a sighting at Waranambo, a locality listed in Stephens & Traylor's (1985) gazetteer as 'Not located'. I have examined a copy of Snyder's field notes and this showed that Waranambo is a misprint for Karanambo (Fig. 2) and that she saw nine *solstitialis* there.

Forshaw (1989) recorded the diet of *solstitialis* as being seeds, nuts, fruits and berries and probably blossoms though the basis for these comments was not given. Geijskes recorded a nest and young in a *Mauritia flexuosa* palm in February (Haverschmidt 1968). Haverschmidt (1968) also said that though *solstitialis* is unknown in the north of Surinam it is common on the southern savannas of Surinam. G.F. Mees, who has revised the late Haverschmidt's (1968) book, advises (*in litt.*) that the latter comment is evidently based on hearsay as only Geijskes saw it there.

Ridgely (1981) said that *solstitialis* is "found principally on natural savannas".

Silva & Willis (1986) recorded *solstitialis* along or near the Rio Amazonas in the following situations:

— a small group in brush by a backwater at Coatã, Rio Canumã, 5 April (not January as published, E. Willis, pers. comm.) 1966,

— 3, 5 and 6 in varzea, Maicá, Santarém, 16 January 1984,

— 2 feeding on small melastomataceous fruits in flooded forest, Rodagém, Santarém, 18 October 1984,

— 3 and 5 in secondary vegetation at Urumari, Santarém, February 1985.

A number of ornithological surveys in southern Venezuela, northern Brazil, Guyana, Surinam and French Guiana (Moskovits *et al.* 1985; Tostain 1980; Davis 1953; Haverschmidt 1950; Friedmann 1948; Chapman 1931; Young 1925, 1928—29; Berlepsch 1908; Salvin 1885—1886; Salvin & Godman 1882—1884; Whitely 1884; C. Voisin, in litt.) did not record *solstitialis*. Much of the field work this century in French Guiana has been in sub-coastal and littoral regions.

The only pertinent genetic data are those of Lucca (1984) who described the G- and C-banded karyotypes of *solstitialis*, *auricapilla* (each from two males) and three other *Aratinga* parakeets but not *jandaya*. Few differences were found between the taxa but *solstitialis* was notable in having less constitutive heterochromatin (broadly, regions of highly repeated DNA). Machado (1975) mentioned but did not describe a hybrid between *solstitialis* and *jandaya* bred in captivity.

Unpublished data

G.F. Mees saw a single individual near Devis Vallen (ca 04°50'N, 57°26'W, see Fig. 2) on the Kabalebo River, Surinam on 3 September 1980. The bird was in a large tree in rather open, secondary forest. Mees did not see *solstitialis* in

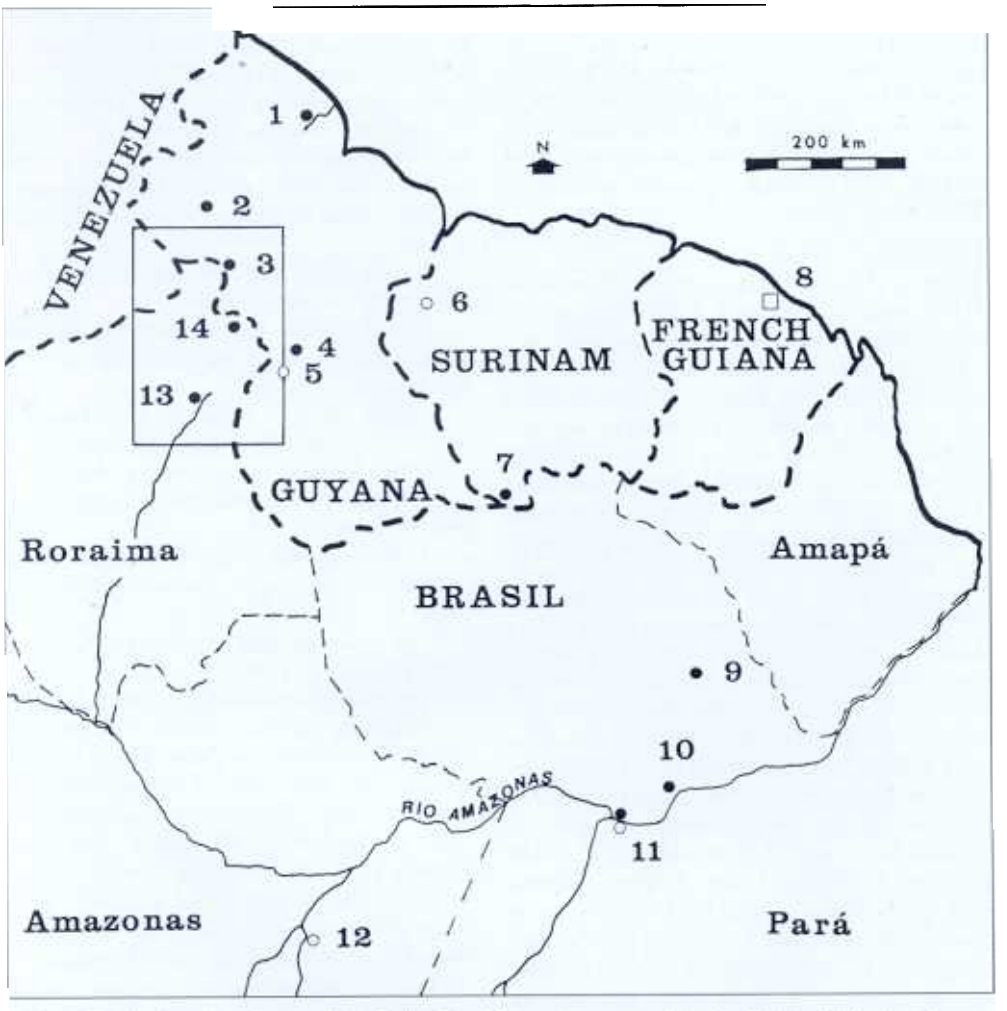

FIG. 2. Distribution of *Aratinga s. solstitialis* based on information reported herein. Only localities of specimens, published sightings and other place names mentioned in the text are shown. Closed circles — specimens; open circles — sightings; open squares — other mentioned localities. 1 — Pomeroon River, 2 — Mazaruni district, 3 — Pacaraima Mountains, 4 — Annai, 5 — Karanambo, 6 — Devis Vallen, 7 — Sipaliwini Savanna, 8 — Cayenne, 9 — middle Rio Paru, 10 — Monte Alegre, 11 — Santarém, 12 — Canuma, 13 — Rio Branco, 14 — Rio Mahu. Some localities of specimens cannot be precisely located (e.g. Quonga is north of Annai — see text). The enclosed region is shown in more detail in Figure 3. Thick broken lines — international frontiers; thin broken lines — state and territory borders within Brasil.

three months of observation in southern Surinam between 1966 and 1972 though Indians there often have the bird in captivity (G. F. Mees, *in litt.*) as do the Wayana Indians on the upper Maroni River in French Guiana (O. Tostain, J.-L. Dujardin, *in litt.*).

At approximately 200 km NNE of Boa Vista, Brazil (Fig. 2), I recorded 25—30 flying rapidly east over open savanna woodland on 7 June 1986, two in flight on 8 June 1986 and seven on 9 June 1986. All were seen in the early morning. Those seen on 9 June were initially seen in flight and,

later, feeding quietly, well concealed among low leaves and branches on one of many rocky outcrops in the open savanna. They were feeding on red fruits of cacti growing between the rocks but the exact nature of their food was not seen. The fruits had soft, white flesh and many small, black seeds. The group flew to leafless branches high above the outcrop's edge and some then returned to the lower vegetation. Then all flew out of sight. I did not record *solstitialis* here in March 1987 when the cacti were not in fruit.

On 30 June 1986, I saw about 20 in a flock flying rapidly over open savanna woodland with scattered, well-vegetated rocky outcrops, about 175 km N of Boa Vista (Fig. 3).

I did not record *solstitialis* in either the extensive, open plains with *Mauritia*-lined creeks between Boa Vista and Km 100 (Fig. 2) or in open savanna north of Km 100 that lacked isolated, well-vegetated rocky outcrops. The Brown-throated Parakeet (*Aratinga pertinax*) was common in the former region but seen infrequently in the latter.

The calls of the birds in flight were an unparrot-like, high-pitched repetitive wheezy call, not unlike the yapping of the Boat-billed Flycatcher (*Megarhynchus pitangua*). (I twice heard *jandaya* yapping similarly in duplets as a contact call in Maranhão, Brazil in December 1985 and I once heard *jandaya* use a repetitive yapping as an alarm call.) The birds seen on 9 June 1986 called occasionally while feeding and, when perched in clear sunlight, emitted more typically parrot-like chuckling notes.

DISCUSSION

Distribution and Variation

Despite considerable field work in southern Venezuela, Surinam and French Guiana since the last century, the occurrence of *solstitialis* in these regions appears to be supported by only a handful of old, poorly labelled specimens, a few sightings and reports of local Indians having the birds in captivity. I infer that *solstitialis* is probably generally scarce but may be locally common in these regions and that further searches for the birds are needed there. Concerning Venezuela, I have shown that Schomburgk's sightings, which formed the basis of Phelps & Phelps's (1958) inclusion of the bird on the Venezuelan list, were made in Brazil and on the Brazilian border with Guyana. Most details of the distribution of *solstitialis* come from Guyana though it is unfortunate that Quonga, from which there are 26 specimens, cannot be located accurately.

Details of *solstitialis* in Brazil are few. Records with locality details are either from near the border with Guyana or along the Rio Amazonas and its tributaries. Apart from the latter records, which are discussed below, the range of *solstitialis* is reliably known only from the region bounded by the Pomeroon River, the Pacaraima Mountains, the Rio Branco, the Paroe-Sipaliwini Savanna and Kabalebo River but not Venezuela and French Guiana. Within this range, the limited data suggest that the birds are generally not common though they may be found at high densities in some places. They inhabit a broader range of habitats than previously realised i.e. open savanna, savanna woodland, forested valleys and secon-

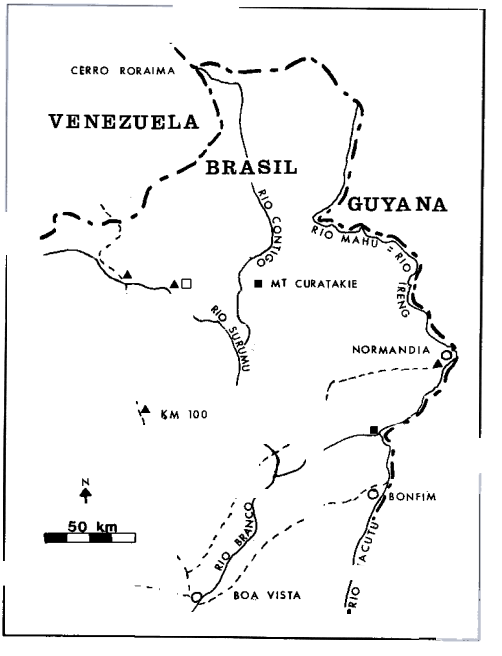

FIG. 3. Distribution of *Aratinga s. solstitialis* in extreme northern Brasil near the borders with Guyana and Venezuela. Closed squares — localities of Schomburgk's (1848) sightings; open squares — my sightings reported herein; triangles — locations of my field searches; broken lines — routes along which I looked casually for *A. s. solstitialis* while travelling.

dary forest. It remains unclear whether the birds' movements represent nomadism or a seasonal pattern based on food availability.

Most notable in this study has been the finding of thirteen specimens, further to the one reported by Pinto (1966), from the Monte Alegre-Santarém region along or near the Rio Amazonas. Together with the sightings in Silva & Willis (1986), the dates of the Rio Amazonas records include all months except May, September and November. This is at least suggestive of a resident population and not one present seasonally. That the available records span 62 years dictates the need for caution here as they are too few to adequately reflect climatic variations from year to year (e.g., Parkes 1985: 1034).

Available data also suggest that a population centred along the Rio Amazonas would be isolated from birds further north and from *jandaya* to the south-east. This may be an artefact of inadequate collecting and observing in the intervening areas, which are mostly terra firme rainforest. Neither *solstitialis* nor *jandaya* has been recorded in terra firme rainforest but it should be recalled here that the sightings of Silva & Willis (1986) were in varzea (flooded forest) or secondary vegetation. There are isolated patches of more suitable habitat, savanna and (probably) campinas, in Amazonia but *solstitialis* has not been recorded in them (e.g., Oren 1981). Therefore, the isolation may be real. Silva & Willis (1986) considered the possibility of a population along the Rio Amazonas having been introduced but favoured, as I do, the hypothesis of a naturally occurring one.

The colour of nine of the Monte Alegre-Santarém birds being intermediate in colour between *solstitialis* and *jandaya* may reflect age-related individual variation because some *solstitialis* in captivity leave the nest with green backs (P. Chapman, pers. comm.) and the juvenile male from further north in Roraima, NHMW 40.683, has a green back and median wing-coverts. Past intergradation, is also a possibility. Dietary factors may also have caused this plumage variation. Further comparisons of the intermediate birds with adults and immatures of both sexes of *solstitialis* and *jandaya* from the geographical cores of their ranges would provide better initial tests of the individual variation hypothesis. At present, the lack of records of *solstitialis* or *jandaya* in isolated patches of Amazonian open savanna argues against primary intergradation. Tests could be conducted with captive birds to determine the role of dietary factors. Clearly, more specimens and field observations are needed.

Taxonomy

Hellmayr (1906) gave no reason for re-assigning the type-locality to Cayenne though 'Guinea' of Linnaeus (1758), based on the old name *Psittacus angolensis*, is obviously incorrect. Berlepsch (1908: 284) evidently followed Hellmayr's re-assignment without comment. 'Cayenne' is a common, nominal type-locality for many bird species named in the 17th and 18th centuries (Stephens & Traylor 1985). Cayenne is an unlikely locality for *solstitialis*, which has not otherwise been recorded in coastal parts of Surinam (Haverschmidt 1968, Young 1927) or anywhere in French Guiana (e.g., Tostain 1980, O. Tostain, *in litt.*). As noted above, however, the species was probably named from a painting that may have in turn have been based on a live bird in captivity in Europe.

TABLE 1. Summary of differences in plumage between *A. s. solstitialis* and *A. s. jandaya*.

Character	*solstitialis*	*jandaya*
Back	yellow	green
Rump	yellow	green, edged red
Lesser and median primary coverts	yellow	green
Leading edge of wing under alula	yellow	blue-green
Crissum	yellow	extensive olive-green with some yellow
Belly and flanks	yellow or orange no olive bases	red with green bases
Thighs	yellow-orange	green

Conservation

Ridgely (1981) suggested that the effects of trapping for the live bird trade have been "minimal" though has pointed out (pers. comm.) that the situation could easily be different now. Roet *et al.* (1981) noted that of 69 imported into the United States between October 1979 and June 1980, 65 originated in countries where the bird is indigenous. Niles (1981) reported that in 1979, 223 *solstitialis* were exported from Guyana. An annual export quota of 600 was recently set by Guyana (Thomsen 1988). I do not know what percentage of this figure it is envisaged will be wild-caught birds. Jorgenson & Thomsen (1987) reported that more than 2,200 were imported into the United States between 1981 and 1985 inclusive. The present study indicates that *solstitialis* is generally less common than previously realised. Trapping may indeed be having adverse effects on *solstitialis*. More concern for its future seems warranted. I do not know whether *solstitialis* has been recorded in the few formally dedicated conservation areas within its range (see Figure 16.37 in Brown 1982) though I am not familiar with the habitats in these areas.

An upgrading of knowledge of the bird's distribution and basic biology should be considered vital to its future conservation. I hope that this study has at least clarified what we do know of *solstitialis* and where museum and field study can now most productively be directed.

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APPENDIX

Specimens of *A. s. solstitialis* located during this study and registered data accompanying them. Aviary bred specimens, specimens with no locality data and those labelled as having come simply from South America are not included. Abbreviations of museum names are as in the Acknowledgements.

Of specimens with their age and sex labelled, four are adult males, three are adult females, two are immature or juvenile males and one is an immature female. A further 20 males and 15 females do not have their age labelled, 12 have age but not sex labelled and 21 have neither age nor sex labelled.

Thirty-nine specimens have a date of collection: 17 are between 1906 and 1957, 15 in 1887, one in 1888 and six in 1832. Eight undated specimens in Paris were collected by Whitely and come from where he collected 13 dated as 1887. They too probably also date from 1887.

Quonga, Guyana
BMNH 1892.1.16.51, 11 Nov 1887, Ad. ♂, H. Whitely; BMNH 1892.1.16.52, 11 Nov 1887, Ad. ♀, H. Whitely; BMNH 1892.1.16.53, 11 Nov 1887, Ad. ♂, H. Whitely; BMNH 1892.1.15.54, 15 Nov 1887, Ad. ♂, H. Whitely; BMNH 1892.1.16.55, 3 Nov 1887, Ad., H. Whitely; BMNH 1892.1.16.56, 22 Oct 1887, Imm. ♂, H. Whitely; BMNH 1892.1.16.57, 15 Oct 1887, Imm., H. Whitely; BMNH 1892.1.16.58, 21 Oct 1887, Juv., H. Whitely; BMNH 1892.1.16.59, 8 Nov 1887, Juv., H. Whitely; BMNH 1892.1.16.60, 20 Oct 1887, Juv., H. Whitely; BMNH 1892.1.16.61, 3 Nov 1887, Juv., H. Whitely; USNM 124711, 14 Oct 1887, ♀; USNM 145673, ♂; USNM 145674, ♂; USNM 145675, ♂; MNHN [1—9], 28 Oct 1887, H. Whitely; part of Boucard colln. Quonza, on labels [= Quonga — LJ]; AMNH: 474266, 21 Nov 1887; AMNH 474267, 21 Nov 1887; AMNH 474265, 12 Dec 1888, Actually from nearby Annai.

Mazaruni district, Guyana
ROM 40818 Mazaruni dist., Brit. Guiana. 1924—5, K. Martlock; Ad., 32859 JHF.

Guyana
BMNH, Imm., F.V. McConnell; BMNH 1922.3.5.4628, Ad., F.V. McConnell; BMNH 1895.11.28.137, Ad. ♀, J.J. Quelch, F.V. McConnell; BMNH 1895.11.28.136, Ad., J.J. Quelch, F.V. McConnell; USP 6490, 1906 Whitely col. 1906; QM 0.11485, Ad. ♂, Recd in Qld 1903, exchange E.229; WHP, Exchange with AMNH; WHP, Juv. ♀, Exchange with AMNH; FMNH 48999, ♂, H. Whitely; MCZ 94675, Whitely; LM B.26.8.16.1, ♀; AMNH 47268, [♀?]; AMNH 47269, [♀?]; AMNH 47270, ♂; AMNH 47271, [♀?].

French Guiana
MNHN, M. Fairn, regd 1894.
The registered locality, 'Guyane', probably refers only to the region of the Guianas — see notes on RMNH Cat No 1 below.

Surinam
RMNH 25597, 3rd qtr 1956, ♂, Paroesavanna, F. Haverschmidt; RMNH 51048, Oct 1956, ♂, Paroesavanna, F. Haverschmidt; RMNH Cat. no. 1, Guyane. Not dated but pre-1820 (G.F. Mees, *in litt.*). From Temminck's collection. See Kuhl 1820: 27. The provenance of this and M. Fairn's MNHN specimen can with certainty be known no more precisely than as the region of the Guianas. 'Guyane' in the early 1800s referred to the entire coastal plain between the Orinoco and Amazonas rivers (Stephens & Traylor 1985). Temminck, however, regarded Guyane as Surinam (G.F. Mees, *in litt.*).

Brazil
A. Imprecise localities
BMNH, Brazil, no date, Ad., Zool. Society; BMNH 1858.9.7.8, Brazil, no date, Ad., Zool. Society, colld. before 1858; BMNH 1890.6.1.45, Brazil, no date, Ad. ♀, J. Natterer; Sclater Colln. Skin of Rio make; USP 12.155, Brazil, 07.6.1930, ♀, oferta do Sr Cristovao; RMNH Cat. no. 3, supposedly Brazil, died 1872 in captivity, Rotterdam; USNM 76821, Brazil, ♂, Verreaux, [? exchange — LJ]; SMNS 36037, Brazil, collected by Merkle; SMNS 22967, Brazil, collected A. Fischer/Augsburg; SMNS 48781, Amazonas, Brazil, collected A. Fischer/Augsburg; AMNH 6207, Brazil; AMNH 6208, Brazil.

B. More detailed localities
RMNH 25098, Jalöeriver, Brasil, F. Haverschmidt per Indians. Sex not known. November 1957; USP 10644, Santarém, na boca do [at the mouth of the] Rio Tapajós, Para, Agosto 1920, ♂, E. Garbe. See Pinto 1966; USP 19.451, Rio Tapajóz, Santarém, 4.3.1935, ♀, A.M. Olalla. The Portu-

guese label data indicate that the specimen was purchased locally as a captive bird; MNHB 31.1962, Monte Alegre, 25 June 1912, ♀, Martins. Iris chestnut, bill and feet black, stomach: fruitsleg[uminous]; SMNH, Rio Maycurú, Monte Alegre district, Pará, June 1928, male, C. Lako; AMNH 474275, AMNH 474259, AMNH 474260, Rio Maycurú, June 1928; LACM 38059, Vista Alegre, Monte Alegre, Amazon R.N., 19 July 1957, ♂; LACM 38060, Vista Alegre, Monte Alegre, Amazon R.N., 19 July 1957, ♀; MNRJ 3469, Monte Alegre, Faz. S. Pedro, Dec 1916, ♀; MNRJ 3468, Monte Alegre, Faz. S. Pedro, Dec 1916, ♂; MNRJ 27411, Mariussu, middle Rio Paru, Para, ♂; MNRJ 27410, Mariussu, middle Rio Paru, Para, ♀; NHMW 40.680, NHMW 40.681, Rio Branco, N. Brazil, 9.1831—7.1832, both ♂; NHMW 40.682, NHMW 40.683, Rio Mahu, bei Forte do Rio Branco, Mar 1832, ♂, ♂ juv.; RMNH Cat. no. 2, Rio Mahu, March 1832, ♀, Natterer. See Pelzeln, 1868/70: 257; NHMW 44.884, Rio Mahu, Brasil, 29 Jan 1832, ♀. See Pelzeln 1871: 257.

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