

## THE STATUS OF NORTH AMERICAN MIGRANTS IN CENTRAL AMAZONIAN BRAZIL<sup>1</sup>

DOUGLAS F. STOTZ<sup>2</sup>

Biological Dynamics of Forest Fragments, INPA-Ecologia,  
C.P. 478, Manaus, AM CEP 69011, Brazil,  
Division of Birds, Field Museum of Natural History, Chicago, IL 60605, and  
Committee on Evolutionary Biology, University of Chicago, Chicago, IL 60637

R. O. BIERREGAARD<sup>3</sup> AND MARIO COHN-HAFT<sup>4</sup>

Biological Dynamics of Forest Fragments, INPA-Ecologia, C.P. 478, Manaus, AM CEP 69011, Brazil

PETER PETERMANN

Max Planck Institute of Limnology, Department of Tropical Ecology, Plön, R.F.G.

JAN SMITH, ANDREW WHITTAKER AND SUMMER V. WILSON

Biological Dynamics of Forest Fragments, INPA-Ecologia, C.P. 478, Manaus, AM CEP 69011, Brazil

**Abstract.** We review the status of North American migrants in Amazonia and present recent records of the authors and co-workers. We report migration dates, maximum counts and new distributional information for 45 species. Included are the first Brazilian records of *Piranga olivacea*, the first Brazilian specimens of *Contopus virens*, and records of several shorebirds primarily restricted to coastal areas in South America that were previously unrecorded from inland Amazonia. Amazonia is south of the main wintering areas for most North American passerines; however, at least eight species winter primarily in Amazonia. Amazonia appears to be an important migratory route for many shorebirds, including major portions of the populations of *Pluvialis dominica*, *Calidris fuscicollis*, and *Calidris melanotos*.

**Key words:** Bird migration; distribution; Amazonia; Brazil; shorebirds; seasonality.

### INTRODUCTION

The status of North American migrants in Amazonia is poorly known. This reflects both the insufficient knowledge of the Amazonian avifauna in general, and also the concentration of recent fieldwork in Amazonia during the local dry season, which corresponds to the North American summer. Recent important studies of North American migrants in Amazonia include Fitzpatrick (1980), Pearson (1980), and Bolster and Robinson (1990). Here we report records of North American migrants from Amazonian Brazil based on work by observers associated with the Biological Dynamics of Forest Fragments (BDFF) project near Manaus and on observations by Pe-

termann on Ila Marchantaria and by Stotz, Cohn-Haft, and Whittaker elsewhere in Amazonian Brazil.

### STUDY SITES

Bierregaard was stationed at Manaus, Amazonas, near the confluence of the Rio Negro and Rio Solimões, as part of the BDFF from 1979 to 1987. The other authors have spent periods ranging from six months to four years in Manaus between 1983 and 1991. Around the city of Manaus, we have engaged in casual observation of birds, including migrants, at a number of sites. Near the city, most of the forest is highly disturbed. Important sites for observations close to Manaus include (see Fig. 1): the Hotel Tropical (about 18 km northwest of the city center along the Rio Negro) with disturbed forest and ornamental plantings; the margins of the Rios Negro and Solimões, especially near Careiro, the ferry port on the south bank of the Amazon—about 10 km southeast of Manaus—where sandbars, the margins of the rivers and relatively tall second growth provide the main habitats of interest to migrants; and three suburban neighborhoods

<sup>1</sup> Received 2 May 1991. Accepted 26 March 1992.

<sup>2</sup> Present address: Museu de Zoologia, Universidade de São Paulo, C.P. 7172, São Paulo, SP, CEP 01064, Brasil.

<sup>3</sup> Present address: Smithsonian Institute, NHB 106, Washington, DC 20560.

<sup>4</sup> Present address: Department of Ecology, Evolution and Organismal Biology, 2000 Percival Stern Hall, Tulane University, New Orleans, LA 70118.

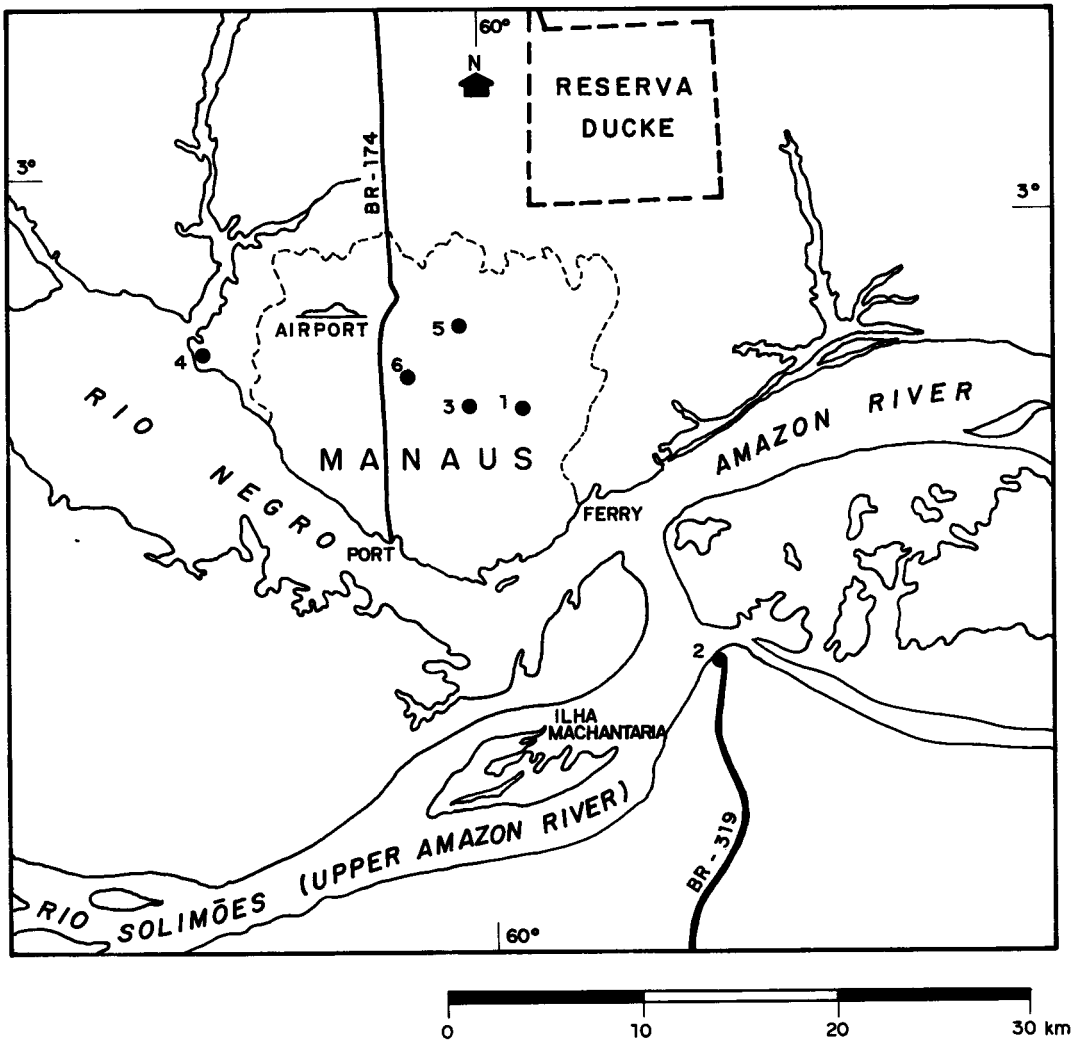


FIGURE 1. Map of the Manaus area with locations mentioned in text: 1—Acariquara, 2—Careiro, 3—Coroado, 4—Hotel Tropical, 5—Parque das Laranjeiras, 6—Parque Dez.

on the north side of Manaus—Parque Dez, Parque das Laranjeiras, and Bairro Coroado. Habitats in these neighborhoods include swamps created by the damming of a stream by roads, a seasonally inundated swamp forest and extensive areas of disturbed *terra firme* forest and small farms, as well as second growth around the residences. In addition, regular coverage of primary forest near the INPA meteorological tower, approximately 50 km north of Manaus along BR 174 (the highway leading to Roraima and, eventually, the Venezuelan border) and of aquatic

habitats, second growth and forest edge at Usina Balbina, a recently completed hydroelectric dam about 100 km north of Manaus ( $01^{\circ}53'S$ ,  $59^{\circ}28'N$ ), provided a variety of migrant records.

The BDFF study site ( $2^{\circ}20'S$ ,  $59^{\circ}50'W$ ), approximately 80 km north of Manaus, is regularly surveyed using mist-nets. Our observations of migrants at this site were obtained opportunistically while conducting mist-net surveys. The site consists of three cattle ranches that are converting *terra firme* forest into pastureland. Most of the area is still forested, but there is substantial

young second growth and pasture. Casual water and stock ponds provide habitat for migrant shorebirds. For a more detailed description of the site, see Stotz and Bierregaard (1989), Lovejoy and Bierregaard (1990) and Rankin-de Meroña et al. (in press).

Petermann worked between September 1988 and June 1990 at Ilha da Marchantaria, about 20 km above Manaus on the Rio Solimões. Most of these records come from sandbars downstream from the island or "floating meadows," extensive mats of aquatic vegetation, dominated by grasses of the genera *Paspalum* and *Echinochloa* (Junk 1970).

Other records included here are mainly those of Stotz from Roraima and Rondônia (Fig. 2). Stotz observed and collected birds at several sites in Roraima between 7 September and 15 October 1987. The most important sites in Roraima were: BV-8 (4°29'N, 61°09'W) at approximately 900 m at the Brazil-Venezuela border, an area of grassland with patches of forest; along the Rio Branco north of Boa Vista (2°49'N, 60°40'W) to the confluence of the Rio Uraricoera and the Rio Tacutu, with gallery forests along the river; Colônia Apiaú (2°39'N, 61°12'W), along the east bank of Igarapé Serrinha, where the habitat was predominately *terra firme* forest; and Ilha Maracá (3°20'N, 61°25'W) where *terra firme* forest, savanna and extensive marshes interdigitate. Cohn-Haft and Whittaker also spent time at Maracá in December 1987. In Rondônia, records came from Cachoeira Nazaré (9°44'S, 61°53'W) on the Rio Jiparaná. Stotz accompanied a group from the Museu de Zoologia, Universidade de São Paulo (MZUSP) and the Field Museum of Natural History (FMNH) to this site between 10 October and 21 November 1986, and returned to the site from 2 February to 15 March 1988. At Cachoeira Nazaré, the predominant habitat is *terra firme* forest, with small clearings with second growth and grass. There is some seasonally flooded forest along the river. Sandbars and river islands provided shorebird habitat in October and November, but were not exposed in March.

## SPECIES ACCOUNTS

In the accounts that follow, we normally use the names of seasons in reference to the seasons in the Northern Hemisphere, where these species breed, although most of the records mentioned are from south of the equator, where the seasons are reversed.

Mississippi Kite (*Ictinia mississippiensis*)—Smith observed an adult on 21 November 1985 at Anavilhanas, about 100 km above Manaus on the Rio Negro. This species is poorly known as a winterer or migrant. It is known as a migrant south to Panama and then virtually disappears. It has been recorded occasionally on migration in northern Colombia (Hilty and Brown 1986), but the only other Amazonian record is that of Robinson and Munn from Manu National Park in southeastern Peru (Terborgh et al. 1984). Wintering is known from south of Amazonia in Paraguay (Hayes et al. 1990), Argentina and Bolivia (American Ornithologists' Union 1983, Davis 1989). Sick (1985) and Stresemann and Amadon (1979) report it from Brazil, but without specific details.

Swainson's Hawk (*Buteo swainsoni*)—Stotz observed an adult on 17 September 1987 at BV-8 in Roraima. There are only scattered records of this species in Brazil, from the southern fringe of Amazonia south (Sick 1985). In Venezuela, it is known only from Mérida (Meyer de Schauensee and Phelps 1978). Most records of migrants are from the Andes or lowlands at their base, but Hilty and Brown (1986) report records of flocks from Leticia.

Broad-winged Hawk (*Buteo platypterus*)—This species is uncommon in tall second growth and forest edge near Manaus both around the city and at the BDFR reserves; Stotz did not observe it in Roraima, however. The dates range from 31 October to 13 March with a maximum of four on 16 December 1984. Willis (1977) reports this species as rare at Reserva Ducke. It was observed on 22 days at the Rio Jiparaná in Rondônia, where Stotz collected a specimen on 6 November. In Rondônia, the earliest record was 20 October and the latest was 13 March. There were

FIGURE 2. Map of Amazonian Brazil showing locations of major rivers, cities, and localities mentioned in text: 1—Alter do Chão, 2—Anavilhanas, 3—Usina Balbina, 4—BDFR Reserves, 5—BV-8, 6—Cachoeira Nazaré, 7—Colônia Apiaú, 8—Ilha de Maracá, 9—INPA meteorological tower, 10—Manacapuru.



only three previous reports for Brazil from the upper Rio Negro and Mato Grosso (Pinto 1938, Sick 1985); our observations indicate that *Buteo platypterus* is more widespread in Amazonian Brazil than previously realized.

Osprey (*Pandion haliaetus*)—This species is present throughout the year in small numbers along the Rios Negro and Solimões near Manaus, and very common from September to March. The maximum observed in a day is eight on 21 December 1985 by Smith. It was common on the Rio Branco north of Boa Vista in mid-October and one was soaring over forest, far from any water, at BV-8 on 17 September.

Merlin (*Falco columbarius*)—An immature female was observed by Whittaker, with R. Ridgely and G. Tudor, at the Hotel Tropical on 21 October 1990. This is only the second record from Brazil (Sick 1985, the other being from Bahia) and appears to be the first from anywhere in Amazonia. It is widespread in northern South America during winter, but rather uncommon and local (Hilty and Brown 1986).

Peregrine Falcon (*Falco peregrinus*)—This species is a regular but rare winter visitor near Manaus and Ilha da Marchantaria; singles have been observed from 5 October to 1 May. The species is more common during migration, but birds have been recorded through the winter at Manaus. In addition, Whittaker observed one at Alter do Chão, on the east bank of the Rio Tapajós, just upstream from Santarem on 10 November 1988. Albuquerque (1978) and Risebrough et al. (1990) give no Amazonian records, although Albuquerque suggests a migration route running down the Rio Negro and across central Amazonia. Sick (1985) reports a December record from the state of Amazonas without further details. Apparently, Peregrines are regular in winter along the lower Rio Napo and the Amazon near Iquitos, Peru (T. Schulenberg; T. A. Parker, pers. comm.). These records suggest that a small population winters along the Amazon and its main tributaries.

Lesser Golden Plover (*Pluvialis dominica*)—This species is rare in winter and common as a fall migrant at Manaus where records extend from 14 September to 24 March. Winter records are exclusively from pastures, while migrants are regular on sand beaches and mud flats along rivers. At Ilha Marchantaria, Petermann has found them exclusively in the fall from 11 September to 6 December with the largest numbers in Oc-

tober and November. He recorded more than 220 on 18 October 1988. In Roraima, one was at a small grassy pond near the Rio Surumú on 7 September and eight were seen 13 October on the Rio Branco north of Boa Vista.

Black-bellied Plover (*Pluvialis squatarola*)—Petermann observed a single bird in winter plumage at Ilha da Marchantaria on 1 November 1989, and Cohn-Haft observed two at Anavilhanas on 10 November 1991. The only previous record from inland Amazonia of this primarily coastal migrant appears to be from the Río Napo of Ecuador (Meyer de Schauensee and Mack 1982), although the specific details of this record are not known to us. It occasionally occurs in inland southern South America (Hayes et al. 1990).

Semipalmated Plover (*Charadrius semipalmatus*)—One was seen by Smith on 29 September 1985 near Manaus at the Careiro ferry crossing. A common coastal migrant in South America, it is extremely scarce inland in Colombia where Hilty and Brown (1986) give only two records, and in Venezuela where it apparently occurs occasionally in the llanos (Meyer de Schauensee and Phelps 1978). We are unable to find any other inland Brazilian records or records from elsewhere in Amazonia.

Solitary Sandpiper (*Tringa solitaria*)—A common migrant and winter visitor, records near Manaus range from 19 July to 21 April, with a maximum of 14 on 11 January 1990 at Ilha da Marchantaria. We have found this species, the most common and widespread migrant shorebird in Amazonia, primarily at small ponds and even puddles in open areas, but also regularly on sandy beaches along rivers. Stotz found it to be regular in Roraima and Rondônia in these habitats as well.

Lesser Yellowlegs (*Tringa flavipes*)—This species is an uncommon fall migrant at Manaus, where unrecorded in spring but with records from 21 August to 11 November. A single bird wintered at Ilha da Marchantaria from December 1988 to 16 February 1989. A bird observed by Cohn-Haft and Whittaker at Ilha Maracá on 7 December may have been still migrating. The maximum in a day is 6 on 21 August 1988.

Greater Yellowlegs (*Tringa melanoleuca*)—This species is an uncommon fall migrant at Manaus; records range from 21 August to 22 November with a maximum of 20 on 21 August 1988. The only spring record is one on 28 March

1983. At Ilha da Marchantaria, this species is regular in fall (maximum 35 on 20 October 1989) with small numbers of wintering birds and occasional spring observations. The latest spring record is on 1 March. In Roraima, Stotz observed singles at Boa Vista, BV-8 and on the Rio Branco.

Spotted Sandpiper (*Actitis macularia*)—This species is a common migrant and winter visitor at both Manaus and Ilha da Marchantaria. Dates range from 14 July to 4 May. The maximum observed is 29 at Ilha da Marchantaria on 8 November 1989. In Roraima, up to five were daily along the Rio Branco 13–16 October, and one was at BV-8 on 10 September. Although occasionally seen at small ponds, around Manaus it is much more regular on beaches and sandbars along the larger rivers.

Ruddy Turnstone (*Arenaria interpres*)—Six sightings from Ilha da Marchantaria, on 12, 18, and 24 October 1988 and 20 October 1989, and 25–26 September 1991 (Cohn-Haft) have been recorded. On 18 October 1988, there were two birds, otherwise records are of singles. The only other published records of this species away from the coast in South America are sight records in the puna zones of Chile and Peru (Fjeldså and Krabbe 1990).

Upland Sandpiper (*Bartramia longicauda*)—Petermann found small numbers at Ilha da Marchantaria between 12 October and 16 November, with one observed on 25 January 1990. Stotz observed one on 2 and 4 February 1988 along a dirt road through forest at Cachoeira Nazaré, Rondônia. This species migrates regularly through Amazonia, but mainly winters south of Amazonia (White 1988). He shows three recent and three pre-1930s winter records (November through February) in Amazonian Brazil, as well as one Peruvian and one Ecuadorian Amazon wintering record.

Sanderling (*Calidris alba*)—Petermann has three records from Ilha Marchantaria, 20 October, 14 November (seven birds) and 21 December 1989. In addition, MZUSP contains a juvenile female of this species collected by a museum expedition on 6 October 1968 on the Rio Solimões, near Fonte Boa, Amazonas (2°32'S, 66°05'W). The only other inland Amazonian record for this species is a sight record from Manu National Park in southeastern Peru (Bolster and Robinson 1990). There are few other inland records in South America (Hilty and Brown 1986, Hayes et al. 1990).

Semipalmated Sandpiper (*Calidris pusilla*)—Our only records are an observation by Whitaker of a single adult on a small pond at Careiro on 29 March 1987 and five records from Ilha da Marchantaria in November and February with a maximum of eight on 16 February 1989. This is an almost strictly coastal species in South America, with Hilty and Brown (1986) mentioning only one inland record and Meyer de Schauensee and Phelps (1978) calling it “occasional inland” in northern Venezuela. In Amazonia, the only other record away from the mouth of the Amazon is a specimen from Santarém collected by A. M. Olalla on 18 November 1932 (Griscom and Greenway 1941).

Least Sandpiper (*Calidris minutilla*)—Our only record near Manaus is one bird at the BDFP study site (Fazenda Esteio) on 6 August 1985 (Smith, J. Bates). Petermann found this species regularly at Ilha da Marchantaria, mainly in the fall, with a maximum of 24 on 14 September 1989, but small numbers wintered and a few occurred during spring migration. In Roraima, Stotz saw eight on October 13 (and collected a juvenile female) and four on 16 October along the Rio Branco. This is a common coastal migrant and winterer along the coasts of South America. Sick (1985) mentions it only from the coast of Brazil. Specimens from Cachuela Esperanza, Dpto. Beni, Bolivia (Gyldenstolpe 1945), and Engenho de Capitão Gama, Mato Grosso (Naumberg 1930) are the only other published records from Amazonian sites. However, MZUSP contains four specimens collected by A. M. Olalla between 9 and 20 March 1969 at Santa Maria de Arapemã, Pará near the mouth of the Rio Tapajós.

White-rumped Sandpiper (*Calidris fuscicollis*)—This species is the most common fall migrant among peeps near Manaus, mainly at small ponds in pastures at the BDFP study site and on sandbars at Ilha da Marchantaria. Our records at Manaus range from 31 August to 22 November. However, Ilha da Marchantaria additionally produced records in December and February. The maximum is 46 on 12 September 1989 at Ilha da Marchantaria. In Roraima, Stotz observed two on 13 October along the Rio Branco north of Boa Vista. At the Rio Jiparaná, this species was recorded at casual water and on sand beaches along the river on four occasions between 24 October and 19 November.

Pectoral Sandpiper (*Calidris melanotos*)—This

species is an uncommon fall migrant at Manaus where records extend from 31 July to 22 November. At Ilha da Marchantaria, it was recorded into winter by Petermann, with the latest on 10 February 1989. It was unrecorded in Roraima by Stotz, but at the Rio Jiparaná in Rondônia it was the commonest migrant shorebird, observed on 10 days with a maximum of ten between 24 October and 19 November.

**Stilt Sandpiper** (*Calidris himantopus*).—Our only records are two birds observed by Smith on 4 September 1985 and two by Cohn-Haft on 15 September 1989 at the BDFP reserves. The status of this species in Amazonia is uncertain. The only other records from Amazonian Brazil appear to be specimens at MZUSP from Tauari, on the Rio Tapajós, collected 17 February 1963 and another from Porto Velho, Rondônia collected 3 November 1954. It is unrecorded in Amazonian Venezuela (Meyer de Schauensee and Phelps 1978), and there is only one record from east of the Andes in Colombia (Hilty and Brown 1986). However, Parker et al. (1983) consider it an uncommon migrant in Peru, and Pearson (1980) considers it a regular transient from eastern Ecuador south to northern Bolivia. Perhaps it migrates primarily through the western fringe of Amazonia, before going east to its main wintering range from southern Brazil and eastern Bolivia south to northern Argentina.

**Buff-breasted Sandpiper** (*Tryngites subruficollis*).—Our only record is three birds observed by Stotz in grasslands near the Boa Vista airport on 28 September 1987. This species is a transient through Amazonia, where it has been recorded several times in the Brazilian Amazon (Sick 1985) and is considered uncommon in Amazonian Peru (Parker et al. 1982). It is unrecorded from southern Venezuela (Meyer de Schauensee and Phelps 1978).

**Hudsonian Godwit** (*Limosa haemastica*).—Whittaker saw a lone bird on 22 September 1990 along the road from Manaus to Manacapuru, west of the Rio Negro, at km 40. At Ilha da Marchantaria, Petermann observed one on 7 December 1988, and others on 20 October and 14 to 26 November 1989 (the same bird?). Stotz observed one in basic plumage in a large collection of shorebirds along the Rio Branco north of Boa Vista on 13 October. These appear to be the first records from Amazonia, although it winters in southern South America south of the Amazonian basin both inland and coastally (AOU

1983). However, unlike other species of shorebirds that pass over Amazonia on their way to wintering grounds, this species is virtually unknown in Bolivia, where there are only two records (Pearson 1975, Parker and Rowlett 1984).

**Common Tern** (*Sterna hirundo*).—Whittaker and Cohn-Haft observed one in first-winter plumage perched on a floating log on 26 November 1987 at Usina Balbina, a recently filled reservoir about 100 km north of Manaus, and Whittaker observed an immature bird 27 October 1991 along the Rio Negro. This species winters widely along South American coasts, but the number of inland records is small. These appear to be the first records from inland Amazonian Brazil, although it is apparently regular at the mouth of the Amazon (Sick 1985). DiCostanza (1978) reports five inland records, only one in Amazonia (Bolivia). Since then Remsen and Ridgely (1980) and Cardiff (1983) have reported an additional four inland records, three from Amazonia, in Peru, Ecuador and Bolivia. Except for a May record from Iquitos, all the inland records with specific information fall in November or December and involve first-year birds.

**Yellow-billed Cuckoo** (*Coccyzus americana*).—One bird was observed on 14 May 1989 by Cohn-Haft, D. Weeks, and T. Towles at the confluence of the Rio Negro and Rio Solimões. Stotz collected one at Cachoeira Nazaré on 8 June 1986. The status of this bird in Brazil, especially Amazonian Brazil is poorly known. The distribution of records (Sick 1985) and recent records from São Paulo (Willis and Oniki 1985) suggest that, in Brazil, this species winters mainly south of Amazonia. However, it is common in winter north of Amazonia in Colombia (Hilty and Brown 1986) and in Venezuela (Meyer de Schauensee and Phelps 1978).

**Common Nighthawk** (*Chordeiles minor*).—This species is an uncommon migrant at Manaus, where fall records range from 5 October to 8 December. The only spring sighting recorded is three seen by Cohn-Haft on 15 and 16 March 1989 at the INPA meteorological tower. However, at both Usina Balbina and Rio Urucu (80 km southwest of Tefé, in western Amazonas), Cohn-Haft found large numbers during the first half of April 1989. Willis and Oniki (1988) also report this species from Balbina in April. In Rondônia, upwards of 50 individuals were observed daily from our arrival on 10 October until 3 November, when they abruptly disappeared. The

species has been recorded locally in Amazonia, including Colombia (Hilty and Brown 1986), and Peru (Parker et al. 1982). There do not appear to be any previous records from Amazonian Brazil, although it is recorded from much of south-eastern Brazil. The winter range of *Chordeiles* is poorly known, but appears to be much smaller than "throughout South America south to northern Argentina" (AOU 1983). The species is common in Paraguay in mid-winter (Hayes et al. 1990), and regular then in southeastern Brazil (Stotz pers. obs., specimens MZUSP). Farther north, the only specific published mid-winter record is from Vaupés, Colombia in February (Hilty and Brown 1986). However, it has been recorded regularly in January from along the Rio Napo in eastern Peru (G. Rosenberg, pers. comm.; Schulenberg, pers. comm.) suggesting that its winter range may include western Amazonia, at least locally.

Chimney Swift (*Chaetura pelagica*)—Whittaker observed two in a mixed group of swifts, including *C. chapmani* and *C. spinicauda* at Manaus on 13 January 1991. Compared to *Chaetura chapmani*, thy appeared longer tailed, showed less contrast between the rump and mantle, and a more contrasting pale throat. In the absence of a specimen and given the difficulties of identification in the genus *Chaetura*, this record is not completely satisfactory. The only previous report of Chimney Swift from Brazil is that of Gilliard (1944), who reported what he believed to be Chimney Swifts entering chimneys in late March at Manaus, and is even more unsatisfactory.

The main identification problem involves *Chaetura andrei*, an austral migrant which breeds in eastern Brazil and apparently winters in northern South America (Sick 1985). It is extremely similar to Chimney Swift, and almost certainly could not be distinguished in the field from that species. The January record of Whittaker seems unlikely to be *C. andrei*, since they are breeding in eastern Brazil at that time; however Gilliard's report comes from a time of year when numbers of *andrei* in southern Brazil have declined from their mid-summer abundance (Stotz, pers. obs.) and could easily have been that species, as suggested by Sick (1985).

The winter range of Chimney Swift remains poorly known. It is common locally in western Peru (Parker et al. 1982), and has been recorded in western Colombia (Hilty and Brown 1986), so

it seems likely that the main wintering grounds are west of the Andes. However, records from Amazonian Ecuador (specimens in FMNH) and Peru (Parker et al. 1982) suggest that a portion of the population, at least, winters in Amazonia.

Eastern Kingbird (*Tyrannus tyrannus*)—We have three records near Manaus: two birds in pastureland north of the city on 29 March 1983, and one along the Rio Solimões about 20 km west of Manaus on 12 December 1984, both seen by Stotz; and Wilson observed a single bird with many Fork-tailed Flycatchers (*Tyrannus savana*) in Bairro Coroado (at Conjunto Acariquara) on 12 February 1991. Sick (1985) mentions only three Brazilian records from the states of Mato Grosso, Amazonas and Bahia. However, this species is common in the lowlands of eastern Peru and northern and eastern Bolivia; it must be regular throughout Amazonian Brazil, although apparently much less common than near the base of the Andes. Recent records of this species along the Rio Juruá, near Eirunepé (2 on 11 October and 1 on 13 October 1991) by Whittaker seem to fit this pattern.

Olive-sided Flycatcher (*Contopus borealis*)—This species is a regular but rare winter visitor around Manaus along forest edge perched on dead snags. Dates of our 16 observations range from 26 October until 19 March (at Usina Balbina). Stotz also observed a single bird at Colonia de Apiaú in Roraima on 10 October. The only specimen from Brazil is a bird collected by Olalla at Itacoatiara on 31 March 1937 (Pinto 1944). However, the species has been recorded elsewhere near Manaus at Reserva Ducke (Willis 1977) and Usina Balbina (Willis and Oniki 1988). In addition, there are several sight records from southeastern Brazil (Willis et al., in press), and Serra dos Carajás (Scott 1988). It appears that Olive-sided Flycatcher is thinly distributed across much of Brazil, although its main wintering grounds is along the lower slopes of the Andes up to about 2,000 m.

Eastern Wood Pewee (*Contopus virens*)—This species winters uncommonly (maximum three in a day) at the edge of primary forest at the BDFR reserves, where our records extend from 30 October to 8 March. There do not appear to be any previously published records from Brazil. Sick (1985) indicates that *virens* occurs in western Brazil, but gives no specific records. Brazil is not included by Traylor (1979) in the wintering range of this species. A specimen in MZUSP, collected



by Olalla on 4 November 1936 at Santa Cruz on the Rio Juruá and reported as *C. cinereus surinamensis* by Pinto (1944), has been examined by Stotz and is a specimen of *virens*. In addition, the species was observed on 22 days at the Rio Jiparaná with records from 11 October until 13 March. Stotz collected specimens there on 5 November and 6 March. Whittaker observed one on 31 December 1988 on the Rio Urucu. It appears that *virens* is widespread, but uncommon, in western Amazonian Brazil. It is much more common at the base of the Andes in eastern Peru (Stotz, pers. obs.).

Alder Flycatcher (*Empidonax alnorum*)—Our only record is of a calling bird observed by Stotz in Manaus on 15 December 1984. The bird gave a typical “fee-bee-o” call, as this species often does in winter. A specimen collected at Santarém on the lower Rio Tapajós on 24 February 1978 (Sick 1985) is apparently the only other record for Brazil. *E. alnorum* is a common winterer in the lowlands of eastern Peru in second growth and is probably regular through much of western Amazonia, although it was not encountered in Rondônia in three months of field work between October and March.

Purple Martin (*Progne subis*)—A common winter visitor near Manaus, and occasional on Ilha da Marchantaria, Purple Martin roosts of up to several hundred individuals occur along the Rio Solimões and Rio Negro along backwaters and lakes near Manaus, as well as in the city itself. Our records extend from 2 August to 11 April. Other observers (T. Sanaiotti, in litt.) have reported this species throughout the year near Manaus. Despite the recent focus on eastern Brazil as the main wintering range of this species (Ridgely and Tudor 1989), our records indicate a substantial Amazonian wintering population.

Bank Swallow (*Riparia riparia*)—Bank Swallows are regularly observed during both fall and spring migration at Manaus. Over 5,000 seen by Whittaker on 10 May 1990 at the mouth of the Rio Negro is the only large concentration at Manaus. At Ilha da Marchantaria, *Riparia* is present from September to May with much reduced numbers during the winter. In May, thousands of birds roosted in the “floating meadows.” Stotz observed two with the large numbers of Barn Swallows at BV-8 in Roraima on 13 September, and one at Colônia Apiaú on 4 October.

Although mid-winter numbers decline around Manaus, records of large numbers in northeast-

ern Peru (G. Rosenberg, pers. comm.; T. Schulenberg, pers. comm.) and the paucity of records from southern South America (Ridgely and Tudor 1989) suggest that the major wintering areas for this species are in Amazonia.

Barn Swallow (*Hirundo rustica*)—Common in pastureland and along the rivers near Manaus, at Ilha da Marchantaria and throughout Roraima, Barn Swallows have been recorded at Manaus from 4 September to 10 May; a single was observed by Whittaker on 10 June 1990. At Ilha da Marchantaria, this species arrives in August. Beginning in September, thousands roost in the floating meadows. Petermann found the largest numbers in April when over 30,000 swallows, predominately Barn Swallows occurred there. Occasional birds remain in June and July around the island (observations of at least 5 different birds). Two June records for Colombia mentioned by Hilty and Brown (1986) are the only other published mid-summer records in South America. Stotz found them common in the grasslands at BV-8 in Roraima beginning 7 September and had scattered records elsewhere in Roraima.

Cliff Swallow (*Hirundo pyrrhonota*)—Two were seen by Smith on 1 October 1986 about 30 km north of Manaus along BR 174. Petermann had two at Ilha da Marchantaria with other swallows on 26 April 1990. Whittaker also observed two at Alter do Chão on 14 November 1988. Sick (1985) mentions a record from Amazonas in November. Otherwise, it seems unrecorded from Amazonia. Cliff Swallows are rarely reported in South America on migration to and from their wintering grounds in southern Brazil, Paraguay and Argentina.

Veery (*Catharus fuscescens*)—A rare migrant through the Manaus region, this species occurs mainly in primary forest. Most records are of mist-net captures at the BDFR reserves. Of sixteen captures, 13 fall between 21 February and 10 April, while only three have been captured during the North American autumn when records range from 3 to 28 November. We have nine additional sight records from February through April. In Rondônia, the situation is reversed; nearly all records came from the North American autumn. Only one individual was netted there in February and March, while it was observed or netted on 11 days between 20 October and 19 November. The highly seasonal pattern of occurrence at these two sites suggests

that this species undergoes regular movements within Amazonia. In the north temperate autumn, the bulk of the population presumably moves south through western Amazonia. The width of this postulated migration corridor is not clear, but it may be rather narrow; there is only a single record each for eastern Peru (Parker 1982) and for Amazonian Colombia (Hilty and Brown 1986). The northward return from the wintering grounds apparently takes place farther east in central Amazonia. The occurrence of this species in Caribbean Colombia strictly as a fall transient (Hilty and Brown 1986) lends further support to the hypothesis of an elliptical route. It seems likely that this species spends winter primarily in the cerrado region of southern Brazil and eastern Bolivia, given the lack of mid-winter specimens from Amazonia, and several winter specimens from Mato Grosso (Sick 1985).

Gray-cheeked Thrush (*Catharus minimus*)—This species is a rare migrant at Manaus. In contrast to Veery, *C. minimus* is recorded approximately in equal numbers during the period 15 October to 9 December (six mist net captures, five sight records) and 1 March to 14 April (seven mist net captures, four sight records). Like Veery, it doesn't appear to winter near Manaus; a bird netted on 3 February 1981 is the only record outside the above dates. *C. minimus* is almost completely unknown from south of the Amazon. Parker (unpubl. data) has a November sight record of a *Catharus* thrush from the Rio Tapajós, probably of this species, and Ridgely and Tudor (1989) shows its wintering range including all of eastern Peru, although the basis for this is uncertain. It remains unclear where the Gray-cheeked Thrushes that we capture at Manaus may spend the winter.

Neither of these thrushes in winter reaches the high densities of Swainson's Thrush (*Catharus ustulatus*) on the lower slopes of the Andes, where it can be the commonest bird in mist net samples (D. Willard, pers. comm.). We suspect that this reflects the greater area of their wintering grounds, as well as the fact that their overall populations are smaller than that of *C. ustulatus*.

Black-whiskered Vireo (*Vireo altiloquus*)—This species winters uncommonly in the vicinity of Manaus. Most records come from tall second growth where it usually occurs alone in the canopy. However, R. Mesquita (in litt.) has three records of this species foraging on the fruits of *Clusia grandiflora* at the BDFR reserves, and there

are three records in primary forest at the INPA meteorological tower accompanying mixed species canopy flocks. Our records range from 13 September to 12 February. This species apparently winters primarily north of the Amazon basin (Meyer de Schauensee and Phelps 1978, Hilty and Brown 1986). Only small numbers occur south of the Amazon River, where the southernmost record appears to be one observed by Stotz and T. Schulenberg in Rondônia at Cachoeira Nazaré on 21 October.

Red-eyed Vireo (*Vireo olivaceus*)—The field identification of northern migrant *V. olivaceus* remains a problem, given a large resident population of this species. The best fieldmarks appear to be the brighter red eye, white vent (rather than yellow) and sharper face pattern of the northern migrants; it should be noted that the eye and vent color of first year nominate *olivaceus*, the migratory race, resemble those of the resident populations. Careful observations by Wilson and Cohn-Haft indicate the presence of small numbers of northern migrants around Manaus and at the BDFR reserves with dates ranging from 3 October to 14 March. Cohn-Haft suggests that only the migratory form occurs in the mixed species canopy flocks of undisturbed *terra firme* forest. The relative dearth of specimens from Amazonian Brazil (of 43 *V. olivaceus* at MZUSP collected in Amazonia between September and March, only six represent northern migrants) compared to eastern Peru (of 11 specimens in FMNH collected in eastern Peru between September and March, seven are northern migrants), suggests that the northern migratory populations of this species may have a distribution pattern similar to that of *Contopus virens*, where the bulk of the population winters at the base of the Andes and small numbers occur eastward in Amazonia.

Yellow Warbler (*Dendroica petechia*)—Two records near Manaus exist for this species, which is common locally in Roraima. Stotz and Bierregaard observed a female-plumaged bird in a flowering tree with a tanager flock at the INPA meteorological tower on 3 December 1984. On 26 October 1991, Cohn-Haft observed a female-plumaged bird in willows at Ilha Marchantaria. In Roraima, Stotz found this species to be common in September and October (as did Whittaker and Cohn-Haft in December) in gallery forest along the Rio Branco, in trees in residential areas and in patches of trees and bushes in savanna.

This species is a common winterer along the northern fringe of the Amazonian forest; Moskovits et al. (1985) report it as common at Ilha Maracá; Roraima and MZUSP contain several specimens from Tapurucuara on the upper Rio Negro. It is rare farther south in Amazonia, however. In Brazil, Sick (1985) reports only two records from south of the northern border region, one from the Rio Purús and one from Marajó Island at the mouth of the Amazon. In addition, there is a sight record from Bolivia (Remsen and Ridgely 1980). Pearson (1980) reported it in small numbers in secondary forest at Limoncocha, Ecuador and Yarinacocha, Peru. In Colombia, however, it is not known in the Amazon basin south of the Macarena mountains (Hilty and Brown 1986).

**Blackburnian Warbler (*Dendroica fusca*)**—Stotz observed a spring-plumaged male on 19 March 1983 at the BDFP reserves (Fazenda Esteio), accompanying a large mixed species canopy flock dominated by tanagers. This appears to be the third record for Brazil. Parker (1983) observed a male in Espírito Santo in southeastern Brazil and Phelps (1972) reports a specimen from Serra Parima on the Brazilian side of the border. This species winters primarily at mid-elevations in the Andes and tepuis. Given that it was found uncommonly at 1,400 m on the Venezuelan slopes of Pico da Neblina (Willard et al. 1991), it is likely to winter at similar elevations in northern Roraima.

**Blackpoll Warbler (*Dendroica striata*)**—This species is an uncommon migrant in forest edge and disturbed forest at Manaus. Dates range from 30 November to 1 April with a maximum of four on 28 March 1983. In addition, T. Sanaiotti netted a bird at Alter do Chão on 2 May 1987 (pers. comm.). This species is usually seen as singles in the canopy, accompanying flocks of tanagers. Stotz observed one in *terra firme* forest near Colonia Apiaú on 9 October, while Cohn-Haft and Whittaker found one at Ilha Maracá on 9 and 12 December. This species is the only North American warbler that winters regularly in lowland Amazonian forest (except perhaps for *Oporornis agilis*, whose wintering grounds are poorly known).

**American Redstart (*Setophaga ruticilla*)**—We have two records from near Manaus, a first-year male seen by Stotz at the Hotel Tropical on 20 April 1983 and a female at Anavilhanas seen by Cohn-Haft on 10 November 1991. Stotz ob-

served this species twice in Roraima, an adult male on 19 September in a fruiting tree at BV-8 and a female-plumaged bird in brush in savanna on Ilha Maracá on 23 September. This species has been reported only a few times from Brazil; Phelps and Phelps (1948) report single specimens from the upper Rio Cotinga in northeastern Roraima, and from the headwaters of the Rio Paduari, Amazonas in the Serra Imeri. A specimen from the Serra Parima reported by Novaes (1965) apparently was collected in Venezuela (Phelps 1972). In addition, the American Museum of Natural History contains an unpublished specimen from Brazil, a female collected by A. M. Olalla at Tauari on the east bank of the Rio Tapajós on 21 April 1931. These appear to be the only Amazonian records of this species which mainly winters in Central America and along the northern fringe of South America.

**Summer Tanager (*Piranga rubra*)**—An uncommon winter visitor near Manaus, few Summer Tanagers occur in residential areas and disturbed forest throughout the city. We have one record from the BDFP field sites north of the city. Willis (1977) also found it at Reserva Ducke. Stotz and Bierregaard observed this species in Roraima with 3 individuals east of Boa Vista on 2 December 1984. This species winters broadly from Central America to western Amazonia (Isler and Isler 1987). In South America, it seems most abundant along the lower slopes of the Andes (Isler and Isler 1987, Ridgely and Tudor 1989). An Olalla specimen at MZUSP collected on 17 December 1960 is from Fordlândia, on the east bank of the Rio Tapajós, well east of the wintering range given by Isler and Isler (1987).

**Scarlet Tanager (*Piranga olivacea*)**—Two observations at Manaus are the only records from Brazil of this species. Stotz and Bierregaard observed a winter-plumaged male with a mixed flock of tanagers on 27 December 1984 at Parque de Laranjeiras on the outskirts of Manaus; Cohn-Haft and Wilson observed a winter-plumaged male near there on 19 December 1987. This species winters primarily in the lowlands at the base of the Andes and along the lower slopes of the eastern Andes (Ridgely and Tudor 1989) where it appears to reach its greatest abundance (southeastern Peru; Fitzpatrick, Stotz and Willard, pers. observ.).

**Bobolink *Dolichonyx oryzivorus***—The only record is the observation by Stotz of three winter-plumaged birds at Cachoeira Nazaré on 14 No-

vember. This species winters primarily in the rice fields of northern Argentina, but is known from scattered records as a transient throughout Amazonia. Sick (1985) gives three records from Amazonian Brazil.

## DISCUSSION

The vast majority of North American passerine migrants winter north of Amazonia. Only a handful of passerine species winter primarily in Amazonia: *Empidonax alnorum*, *Tyrannus tyrannus*, *Catharus fuscescens*, *Catharus minimus*, *Vireo olivaceus*, *Dendroica striata*, probably *Oporornis agilis* and possibly *Riparia riparia*. A few other species, such as *Contopus virens*, *Progne subis*, and *Dendroica petechia* have substantial populations wintering in Amazonia, but are more abundant elsewhere. Most other passerine migrants in Amazonia are rare, and have their main wintering sites along the lower slopes of the Andes (*Piranga olivacea*) or in northern South America (*Vireo altiloquus*).

Migrants generally constitute only a small proportion of the individuals in central Amazonian sites (Bierregaard 1990), as is the case elsewhere in lowland Amazonia (Pearson 1980). At Manaus only about 0.1% of the birds mist-netted and banded by the BDFP project have been migrants. This contrasts with the lower Andean slopes, even as far south as southern Peru, where migrants are a conspicuous element of the avifauna (Terborgh 1989). However, the diversity of passerine migrants differs little between the lowland forests in Amazonia and the pre-montane forests of the Andes. About 15 species of passerine migrants winter in each region.

In Amazonia, most of the migrant passerines are associated with edge habitats, and only the *Catharus* thrushes, and perhaps *Vireo olivaceus*, seem dependent on undisturbed *terra firme* forest. That edges and disturbed habitats are most important to migrants (Monroe 1970) seems true in Amazonia. Primary forest is apparently important to more migrants in Central America and the West Indies (see Terborgh 1989), although even in Central America the majority of northern migrants use secondary habitats (Stotz unpubl.).

Concern about the destruction of tropical rainforest in North America has focused on its effects on North American migrants, and on the destruction of the Amazonian rainforest. It is perhaps paradoxical that these two elements have essentially nothing to do with one another. Few

species of landbird migrants reach Amazonia, and those that do are mostly in secondary habitats. We hope that the dependence of only two species of northern migrant on primary Amazonian rainforest will not cause loss of interest in the preservation of this ecosystem which has more than 450 bird species (Haffer 1990), and probably millions of other organisms, restricted to it.

Shorebirds are the most common migrants in central Amazonia, but most are on passage to wintering grounds farther south. Variation in river levels causes extreme seasonal differences in the local availability of habitat for shorebirds (Bolster and Robinson 1990). Near Manaus and in Rondônia, fall migration coincides with low water levels, when the greatest amount of habitat is available. In spring, most sandbars and beaches are under water and shorebirds are substantially less common than in the fall. In Roraima, the dry season begins in September, and water levels presumably decline throughout the winter. The status of shorebird migration in the spring there is unknown, but the shorebirds observed there by Stotz during fall migration were common and diverse by Amazonian standards.

Terborgh (1989) suggested that the dearth of records of several species as migrants in Central America and northern South America reflects migration involving a direct flight to the wintering grounds. We feel that it is more likely that the lack of records reflects poor coverage in Amazonia. Four of the five species that Terborgh suggests show this pattern: *Pluvialis dominica*, *Limosa haemostica*, *Bartramia longicauda*, and *Calidris fuscicollis*, are represented here by records. Except for *Limosa*, there are numerous records of these species in Amazonia. The other species that Terborgh suggests may overfly northern Latin America is *Calidris bairdii*, which is unknown from the Amazonian lowlands, but occurs commonly on migration through the high Andes (Parker et al. 1982, Fjeldså and Krabbe 1990) to its southern wintering grounds.

The apparent readiness with which migratory shorebirds use cattle ponds and casual water in newly cleared areas of forest in central Amazonia implies a shortage of adequate habitat away from large rivers. Our records suggest that the floodplains of Amazonian rivers provide more important habitat for migratory shorebirds than is generally acknowledged. Although they do not support high densities, their absolute abundance

in area may provide staging areas for a significant proportion of some shorebird species, in particular *Phuvialis dominica*, *Calidris fuscicollis*, and *Calidris melanotos*.

#### ACKNOWLEDGMENTS

We thank all of our colleagues on the BDFF project for help in the field, companionship, and records of migrants. Our field work at Manaus was supported by World Wildlife Fund-US, the Instituto Nacional de Pesquisas da Amazonia (INPA), a grant from the National Park Service (cooperative agreement CX-0001-9-0041), and the Man in the Biosphere Program of USAID. Stotz's work was made possible by assistance from Celso de Morato Carvalho, José Antonio Gomes and Paulo Vanzolini in Roraima, and the staff of the Consórcio Nacional de Engenheiros Consultórios office in Porto Velho, and Scott Lanyon, Dave Willard and Tom Schulenberg in Rondônia. He received monetary support from a National Science Foundation Pre-Doctoral Fellowship and from the Division of Biological Sciences at the University of Chicago. Carlos Peres helped Whittaker and Cohn-Haft on visits to the Rio Uruçu, and their field work at Ilha Maracá was made possible by the Royal Geographic Society. We thank Tania Sanaïotti for information on Purple Martins near Manaus, and other records. This paper benefitted from comments by Gary Rosenberg, Tom Schulenberg and an anonymous reviewer. This is publication number 82 in the Minimum Critical Size of Ecosystems Project Technical Series.

#### LITERATURE CITED

- ALBUQUERQUE, J.B.L. 1978. Contribuição ao conhecimento de *Falco peregrinus* Tunstall 1771 na América do Sul (Falconidae, Aves). *Rev. Bras. Biol.* 38(3):727-737.
- AMERICAN ORNITHOLOGISTS' UNION. 1983. Checklist of North American Birds. 6th ed. American Ornithologists' Union, Lawrence, KS.
- BIERREGAARD, R. O., JR. 1990. Species composition and trophic organization of the understory bird community in a central Amazonian terra firme forest, p. 217-234. *In* A. Gentry [ed.], *Four neotropical rainforests*. Yale Univ. Press, New Haven, CT.
- BOLSTER, D. C., AND S. K. ROBINSON. 1990. Habitat use and relative abundance of migrant shorebirds in a western Amazonian site. *Condor* 92:239-242.
- CARDIFF, S. W. 1983. Three new bird species for Peru, with other distributional records from northern Departamento de Loreto. *Gerfaut* 73:185-192.
- DAVIS, S. E. 1989. Migration of the Mississippi Kite *Ictinia mississippiensis* in Bolivia, with comments on *I. plumbea*. *Bull. Brit. Ornith. Club* 109:149-152.
- DICOSTANZA, J. 1978. Occurrences of the Common Tern in the interior of South America. *Bird-banding* 49:249-251.
- FITZPATRICK, J. W. 1980. Wintering of North American tyrant flycatchers in the Neotropics, p. 67-78. *In* A. Keast and E. S. Morton [eds.], *Migrant birds of the Neotropics. Ecology, behavior, distribution and conservation*. Smithsonian Institution Press, Washington, DC.
- FJELDSÅ J., AND N. KRABBE. 1990. *Birds of the High Andes*. Apollo Books, Svendborg, Denmark.
- GILLIARD, E. T. 1944. Chimney Swifts (?) at Manaus, Brazil. *Auk* 61:143-144.
- GRISCOM, L., AND J. C. GREENWAY, JR. 1941. Birds of Lower Amazonia. *Bull. Mus. Comp. Zool.* 88: 85-334.
- GYLDENSTOLPE, N. 1945. A contribution to the ornithology of northern Bolivia. *Kungl. Svenska Vet-Akad. Handl.*, ser. 3, 23(1).
- HAFER, J. 1990. Avian species richness in tropical South America. *Stud. Neotrop. Fauna Environ.* 25:157-183.
- HAYES, F. E., S. M. GOODMAN, J. A. FOX, T. GRANIZO TAMAYO, AND N. E. LÓPEZ. 1990. North American bird migrants in Paraguay. *Condor* 92:947-960.
- HILTY, S. L., AND W. L. BROWN. 1986. *A guide to the birds of Colombia*. Princeton Univ. Press, Princeton, NJ.
- ISLER, M. L., AND P. R. ISLER. 1987. *The tanagers: natural history, distribution, and identification*. Smithsonian Institution Press, Washington, DC.
- JUNK, W. J. 1970. Investigations on the ecology and production-biology of the "floating meadows" (*Paspalo-Echinochloetum*) on the middle Amazon. Part I: The floating vegetation and its ecology. *Amazoniana* 2:449-495.
- LOVEJOY, T. E., AND R. O. BIERREGAARD, JR. 1990. Central Amazonian forests and the Minimum Critical Size of Ecosystems Project, p. 60-74. *In* A. Gentry [ed.], *Four neotropical rain forests*. Yale Univ. Press, New Haven, CT.
- MEYER DE SCHAUENSEE, R., AND W. H. PHELPS, JR. 1978. *A guide to the birds of Venezuela*. Princeton Univ. Press, Princeton, NJ.
- MEYER DE SCHAUENSEE, R., AND A. L. MACK. 1982. Addenda to "A guide to the birds of South America," p. 429-463. *In* R. Meyer de Schauensee, *A guide to the birds of South America*. The Academy of Natural Sciences, Philadelphia, PA.
- MONROE, B. L., JR. 1970. Effects of habitat changes on population levels of the avifauna in Honduras. *In* H. K. Buechner and J. H. Buechner [eds.], *The avifauna of northern Latin America*. *Smithson. Contrib. Zool.* 26:58-61.
- MOSKOVITS, D., J. W. FITZPATRICK, AND D. E. WILLARD. 1985. Lista preliminar das aves da Estação Ecológica de Maracá, Território de Roraima, e áreas adjacentes. *Papeis avuls. Zool. S. Paulo* 36(6): 51-68.
- NAUMBERG, E.M.B. 1930. *The birds of Matto Grosso, Brazil. A report on the birds secured by the Roosevelt-Rondon Expedition*. *Bull. Amer. Mus. Nat. Hist.* 60:1-432.
- NOVAES, F. C. 1965. *Notas sobre algumas aves da Serra Parima, Território de Roraima*. *Bol. Mus. Par. Emilio Goeldi* No. 54.
- PARKER, T. A., III. 1982. Observations of some unusual rainforest and marsh birds in southeastern Peru. *Wilson Bull.* 94:477-493.

- PARKER, T. A., III. 1983. A record of the Blackburnian Warbler (*Dendroica fusca*) for southeastern Brazil. *American Birds* 37:274.
- PARKER, T. A., III, S. A. PARKER, AND M. A. PLENGE. 1982. An annotated checklist of Peruvian Birds. Buteo Books, Vermillion, SD.
- PARKER, T. A., III, AND R. A. ROWLETT. 1984. Some noteworthy records of birds from Bolivia. *Bull. Brit. Ornith. Club* 104:100-113.
- PEARSON, D. L. 1975. Range extensions and new records for bird species in Ecuador, Peru, and Bolivia. *Condor* 77:96-99.
- PEARSON, D. L. 1980. Bird migration in Amazonian Ecuador, Peru, and Bolivia, p. 273-283. In A. Keast and E. S. Morton [eds.], *Migrant birds of the Neotropics. Ecology, behavior, distribution and conservation*. Smithsonian Institution Press, Washington, DC.
- PHELPS, W. H., AND W. H. PHELPS, JR. 1948. Descripción de seis aves nuevas de Venezuela y notas sobre veinticuatro adiciones a la avifauna del Brasil. *Bol. Soc. Venez. Cienc. Nat.* 11(71):53-74.
- PHELPS, W. H., JR. 1972. Adiciones a las listas de aves de Sur America, Brasil, y Venezuela y notas sobre aves venezolanas. *Bol. Soc. Venez. Cienc. Nat.* 30 (124-125):23-40.
- PINTO, O. M., DE O. 1938. Catálogo das aves do Brasil (1ª parte). *Rev. Mus. Paulista* 23:1-566.
- PINTO, O. M., DE O. 1944. Catálogo das aves do Brasil (2ª parte). *Secretário Agri., Ind., e Com., São Paulo*.
- RANKIN-DE MERONA, J. M., G. T. PRANCE, M. F. SILVA, W. A. RODRIGUES, AND M. UEHLING. In press. Resultados preliminares de um levantamento florestal de 31 ha de terra firme na Amazônia central: Descrição geral da vegetação e dados taxonômicos. *Acta Amazonica*.
- REMSEN, J. V., JR., AND R. S. RIDGELY. 1980. Additions to the avifauna of Bolivia. *Condor* 82:69-75.
- RIDGELY, R. S., AND G. TUDOR. 1989. *The birds of South America*. Univ. of Texas Press, Austin, TX.
- RISEBROUGH, R. W., A. M. SPRINGER, S. A. TEMPLE, C. M. WHITE, J.L.B. ALBUQUERQUE, P. H. BLOOM, R. W. FYFE, M. N. KIRVEN, B. A. LUSCOMBE, D. G. ROSENEAU, M. SANDER, N. J. SCHMITT, C. G. THELANDER, W. GUILLERMO VASINA, AND W. WALKER, III. 1990. Observaciones del Halcon Peregrino, *Falco peregrinus* subsp., en America del Sur. *Rev. Bras. Biol.* 50:563-574.
- SCOTT, D. A. 1988. Preservação da natureza e pesquisa sobre fauna pela CVRD: Observações e sugestões. *Espaço, Ambiente e Planejamento* 2(7): 1-51.
- SICK, H. 1985. *Ornitologia brasileira, uma introdução*. Vols. 1 and 2. Editora Universidade de Brasília, Brasília.
- STRESEMANN, E., AND D. AMADON. 1979. Order Falconiformes, p. 271-425. In E. Mayr and G. W. Cottrell [eds.], *Checklist of birds of the world*. Vol I, 2nd ed. Museum of Comparative Zoology, Cambridge, MA.
- STOTZ, D. F., AND R. O. BIERREGAARD. 1989. The birds of the Fazendas Porto Alegre, Esteio and Dimona north of Manaus, Amazonas, Brazil. *Rev. Bras. Biol.* 49:861-872.
- TERBORGH, J. W. 1989. *Where have all the birds gone?* Princeton Univ. Press, Princeton, NJ.
- TERBORGH, J. W., J. W. FITZPATRICK, AND L. EMMONS. 1984. Annotated checklist of bird and mammal species of Cocha Cashu Biological Station, Manu National Park, Peru. *Fieldiana (Zool.) (New Ser.)* No. 21.
- TRAYLOR, M. A., JR. 1979. Family Tyrannidae, p. 1-245. In M. A. Traylor, Jr. [ed.], *Check-list of birds of the world*, Vol VIII. Museum of Comparative Zoology, Cambridge, MA.
- WHITE, R. P. 1988. Wintering grounds and migration patterns of the Upland Sandpiper. *Am. Birds* 42: 1247-1253.
- WILLARD, D. E., M. S. FOSTER, G. F. BARROWCLOUGH, R. W. DICKERMAN, P. F. CANNELL, S. L. COATES, J. L. CRACRAFT, AND J. P. O'NEILL. 1991. The birds of Cerro de la Neblina, Territorio Federal, Venezuela. *Fieldiana (Zool.)* n.s. No. 65.
- WILLIS, E. O. 1977. List preliminar das aves da parte noroeste e áreas vizinhas da Reserva Ducke, Amazonas, Brasil. *Rev. Bras. Biol.* 37:585-601.
- WILLIS, E. O., AND Y. ONIKI. 1985. Bird specimens new for the state of São Paulo, Brazil. *Rev. Bras. Biol.* 45:105-108.
- WILLIS, E. O., AND Y. ONIKI. 1988. Aves observadas em Balbina, Amazonas e os prováveis efeitos da barragem. *Cienc. Cult. (São Paulo)* 40(3):280-284.
- WILLIS, E. O., D. SNOW, D. F. STOTZ, AND T. A. PARKER, III. In press. Olive-sided Flycatchers (*Contopus borealis*) in southeastern Brazil. *Wilson Bull.*