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TRUE WINTER RANGE OF THE VEERY (*CATHARUS FUSCESCENS*): LESSONS FOR DETERMINING WINTER RANGES OF SPECIES THAT WINTER IN THE TROPICS

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ABSTRACT.—Most recent references describe the winter range of the Veery (*Catharus fuscescens*) as including an extensive area from northern Colombia, Venezuela, and Guyana south to south-central Brazil. Analysis of seasonal distribution of specimen records in South America, however, shows that 91 of 105 specimens were taken during spring and fall, not winter; the remaining 14, taken from 2 December to 20 February, are all from three small areas at the periphery or south of the Amazon basin. Thus, the true winter range is almost completely south and east of the area generally described. The seasonal distribution of specimen records is consistent with observational data from South America and banding data from the Neotropics. Although those data must be treated cautiously, it appears that the true winter range of the Veery is in south-central and southeastern Brazil, an area where habitat destruction threatens many natural habitats, rather than in the relatively undisturbed areas of western Amazonia. Widespread erroneous portrayal of the winter range of the Veery seems to have been caused largely by the assumption that the species winters in South America wherever it has been recorded and by overlooking a previously published analysis of its winter distribution. *Received 20 December 1999, accepted 16 April 2001.*

CONCERN OVER APPARENT declines in populations of certain North American bird species that winter at tropical latitudes is a pervasive theme of recent research in the conservation ecology of birds. Debate over causes of the apparent declines centers around breeding versus migration versus winter factors (e.g. Morse 1980, Böhning-Gaese et al. 1993, Rappole and McDonald 1994). Basic to understanding the latter is knowledge of where each species spends the winter (nonbreeding) season between fall and spring migration. Calculations of energetic costs of migration and of potential flight range based on fat stores (e.g. Odum et al. 1961) versus actual migration distance also depend on accurate calculations of distance from winter to breeding ranges. Likewise, interpretations of influence of interspecific competition (e.g. Barlow 1980, Fitzpatrick 1980, Keast 1980) or other factors in determining limits of a species' winter distribution also rest on accurate representations of winter ranges.

Reference works on distribution of birds in the Western Hemisphere typically give the winter range of the Veery (*Catharus fuscescens*) as including much or most of tropical South America east of the Andes and sometimes even Central America (Table 1). Using widely available references, one would conclude that the winter range of the Veery is so large, and includes much of perhaps the largest wilderness remaining on the planet (namely portions of western Amazonia and the upper Orinoco Basin), that conservation concerns should focus on breeding or migration distributions. No evidence exists for specialization on any particular habitat within the winter range.

A few references, however, have suggested or proposed a more restricted winter distribution. Hilty and Brown (1986) stated that it was a ''very uncommon'' fall migrant in Colombia, with only one spring (sight) record and no true winter records. Meyer de Schauensee (1964) had earlier stated that Colombia had only fall (October) records but still gave its status as ''probably winter resident.'' Tyler (1949) questioned many previously published statements on the large winter range of the Veery, and he restricted the winter distribution to ''principally in southern Brazil,'' but that seems to have been overlooked or ignored by all subsequent authors except Phillips (1991), who nevertheless unaccountably gave the winter range as essentially north and west (''upper Amazonia to C[entral] Bolivia?'') of the area described by Tyler.

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TABLE 1. Descriptions of the winter range of the Veery summarized from widely used reference works, in chronological order.

Winter range	Reference
Essentially unknown	Baird (1872)
Essentially unknown, but sparingly in Florida	Coues (1884)
Essentially unknown	AOU (1886)
Sparingly in Florida, but mainly south of United States to Brazil	AOU (1895)
Yucatan, Costa Rica, Panama, n. Colombia, Guyana, and Brazil	Ridgway (1907)
Colombia, Guyana, Venezuela, Brazil	AOU (1910)
Colombia, Guyana, Brazil	AOU (1931)
Colombia, Guyana, Venezuela, Brazil	Hellmayr (1934)
Southern Brazil	Tyler (1949)
Colombia, Guyana, Venezuela, Brazil	AOU (1957)
Colombia, Guyana, and Venezuela to south-central Brazil	Ripley (1964)
Central America south to Colombia and central and ne. Brazil	Godfrey (1966)
Colombia, Guyana, Venezuela, Brazil	Meyer de Schauensee (1966)
Colombia, Guyana, Venezuela, Peru	Snyder (1966)
Colombia, Guyana, Venezuela, Brazil	Meyer de Schauensee (1970)
Central America and n. South America	Peterson (1980)
Colombia, Venezuela, Trinidad, Guyana, south to Amazonian and central Brazil	AOU (1983)
Colombia, Venezuela, and Guyana, south to Amazonian and central Brazil	Rappole et al. (1983)
Panama, Colombia, Venezuela, Brazil	Wetmore et al. (1984)
Central America south to Colombia and central and ne. Brazil	Godfrey (1986)
Northern South America	Cramp (1988)
Northern South America	Ridgely and Gwynne (1989)
Colombia, Guyana, Venezuela, w. Amazonian Brazil, and n. Bolivia; sight record from e. Peru	Ridgley and Tudor (1989)
South-central South America	Sibley and Monroe (1990)
Central South America (upper Amazonia to central Bolivia?)	Phillips (1991)
Colombia to Brazil	Howell and Webb (1995)
Northern half of South America, Trinidad	Paynter (1995)
Guyana, n. Venezuela, e. Colombia, w. Amazonian Brazil, n. Bolivia	Moskoff (1995)

Stotz et al. (1992), observing that the Veery was strictly a fall and spring transient at their study sites in central Amazonia, proposed that the true winter range was farther south, ''primarily the cerrado region of southern Brazil and eastern Bolivia.'' Their hypothesis, however, was overlooked by subsequent reference works. They also proposed that the migration route in South America was elliptical, with the fall route farther west than the spring route.

Given those dramatic differences in published accounts of the winter distribution of a common species of North American bird, my goal was to determine what the true winter range of the Veery is and why reference works conflict so greatly.

METHODS

As a first approximation of winter range, I plotted museum specimen records by month on maps of the Western Hemisphere. Use of specimen records to define seasonal distribution has several major problems. First, it under-samples the population's true distribution simply because so few individuals have been collected compared to the size of the population. Second, geographic distribution of specimens is strongly biased towards easily accessible areas, for example, near towns and rivers in Amazonia. Third, seasonal distribution is biased towards the field seasons of those who collect specimens, for example, often avoiding the wet season in tropical areas. Fourth, even within a bird species, individuals may be more conspicuous or more easily collected at certain times of the year than others. Fifth, absence of specimens from a locality does not necessarily mean that the species does not occur there, because even proficient collectors are unable to sample the entire avifauna of a locality. In some cases, collectors may eschew common species in preference for uncommon ones. Sixth, existence of a specimen from a locality does not necessarily mean that the species occurs there regularly. For example, the March specimen from Chile (Appendix) presumably represents an out-of-range occurrence, and a December specimen from Louisiana

(an individual that could barely fly on 18 December 1983 collected by G. H. Rosenberg; LSUMZ 113056) does not mean that the true winter range should include Louisiana. Seventh, the small size of the database makes it impossible to detect annual or short-term changes in range. Therefore, distribution of specimen sampling must be regarded warily by anyone hoping to approximate an unbiased sampling design.

Nevertheless, for a species whose winter range lies outside the few areas, such as North America, where other kinds of sampling efforts (e.g. Christmas Bird Counts; Root 1988) are available, I know of no alternative to the specimen record for data for a large geographic area. Also, use of specimens has some advantages. First, it greatly diminishes the problem of reliability with respect to identification. *Catharus* thrushes are among those groups that pose chronic problems in field identification (Dunn and Garrett 1983, Lane and Jaramillo 2000). For example, the Gray-cheeked Thrush (*C. minimus*) was reported on Christmas Bird Counts in North America 24 times in 10 years (Root 1988), but there is only one verified December or January record ever from North America (American Ornithologist's Union 1998). Second, specimen data can be analyzed with respect to geographic and seasonal distribution of age, sex, and subspecies categories.

I solicited all specimen records of Veery from south of the United States from all major museums (see Acknowledgments). For specimens from geographical or seasonal extremes, I asked curators to verify dates and localities as well as identification of the specimen. I did not analyze the specimen data by subspecies because to corroborate those identifications, all specimens would have to be borrowed.

To attempt to determine whether the specimen record is misleading as to the status and range of the Veery in the South America, I also searched published faunistic information, particularly locality lists, that relied on sight reports or banding records, and I also solicited some unpublished observations from those in a position to provide critical information. To supplement specimen data, I also requested from the Bird Banding Lab data on all banding records of the Veery from anywhere south of the United States.

I considered ''winter range'' to be the geographic area occupied by the species during that part of the annual cycle between fall and spring migration when individuals are relatively sedentary and not in the physiological state associated with long-distance movements. In the absence of data on individual Veeries during the nonbreeding season, application of such a definition becomes problematic. Veeries are migrating in the United States as late as late October and as early as late March (Tyler 1949), so those periods must obviously be excluded. In middle America, considered north of the winter range by virtually all recent references, migrants are detected as early as early March and as late as late November (Ridgely and Tudor 1989, Stiles and Skutch 1989). Also, subcutaneous fat levels of some specimens from South America are moderate into late November, and specimens from localities where the species does not overwinter have been taken as late as 1 December (Appendix) and as early as 21 February (Stotz et al. 1992). That leaves the period 2 December to 20 February as the only period for which evidence of migration is lacking. Therefore, I arbitrarily assumed that specimens taken in that period represented individuals from the winter range.

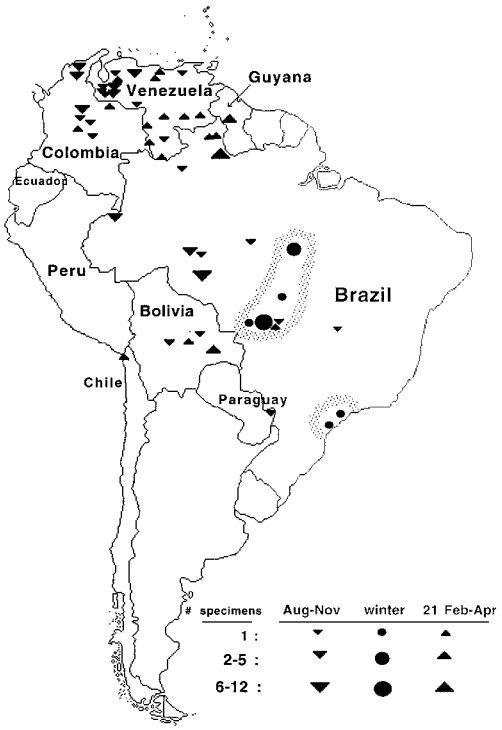

FIG 1. Distribution of specimens of Veeries taken in South America. The areas outlined with dotted lines are those from which winter specimens have been collected.

RESULTS

Of the 105 specimens of Veeries from south of the United States, only 14 were taken from 2 December to 20 February (Appendix). All of those specimens are from two small areas in central Brazil at the southern periphery of the Amazon Basin and one area in southeastern Brazil in São Paulo (Fig. 1). Those areas barely overlap with the published descriptions of the

location of the winter range, generally considered to lie to the north and west of that area. The area encompassed by specimen localities is <10% of that given for the winter range of the Veery by most references; however, if the species occurs in winter in the regions between the specimen localities, which seems likely, then the difference is reduced, but still substantial (~50%). The difference in the northern limit of the winter range in many reference works (northern Colombia), compared to that indicated by the winter specimen records is ~3,400 km. To put that in perspective for those more familiar with North American geography, that is roughly the distance from New York City to northern Baffin Island, or from New York City to Caracas, Venezuela.

Banding records also support the pattern generated by specimen data. Of 1,005 individuals encountered south of the United States, all from Mexico and the Bahamas to Venezuela, only two records were from December, January, or February. One was a clerical error (F. G. Stiles pers. comm.). The other, a bird banded in Jalisco, Mexico, on 13 January 1983, had a wing length of 83 mm, far too short for a Veery (but appropriate for the similar-appearing Russet Nightingale-Thrush [*Catharus occidentalis*]). Of the remaining 51 records for Mexico and Belize, none were later than October or earlier than April. Of the 837 records from Costa Rica and Panama, none were from December, January, or February. Of the 28 records from the West Indies, none were later than October or earlier than April. Of the 87 records from Venezuela, all were from October or April–May.

The geographic distribution of specimens during migration suggests a difference in route between autumn and spring migration (more westerly in fall than in spring; Fig. 1), supporting Stotz et al.'s hypothesis. If one draws a straight line from areas of northeastern Colombia where there is a concentration of fall specimens, through the area in Rondônia whence there are a number of fall specimens, and through the presumed wintering area in Mato Grosso, the line hits southeastern Brazil in the state of São Paulo, which is where there are additional winter records. The unusual migration route of the Veery in the Western Hemisphere in will be discussed elsewhere (J. V. Remsen unpubl. data).

Small sample size for winter specimen records precludes an analysis of sexual differences in winter distribution. Qualitatively, no obvious difference in winter distribution of males and females is evident from the winter specimens (Appendix). However, with four (Ripley 1964) or five (Phillips 1991) subspecies and four age–sex categories, potential is high for interesting seasonal and geographic ''texture.'' At least partial segregation by subspecies within the winter range seems likely given the size and climatic heterogeneity of the winter range.

Specimen records provide a conservative view of extreme dates for migration. Nevertheless, extreme dates of some specimens are noteworthy. The earliest fall record from South America is from 18 August, in northern Venezuela, which would be an early date even in the southern United States (Tyler 1949). The next-earliest specimen, however, is from 28 September, again in northern Venezuela. One specimen from the heart of the presumed winter range in Mato Grosso, Brazil, was collected on 1 October, so some individuals reach the wintering grounds early.

The latest spring record from South America is 29 April, from northern Venezuela, when the species is also peaking as a spring migrant along the Gulf Coast of the United States (J. V. Remsen et al. unpubl. data). The latest specimen from within the winter range is 4 April, from Mato Grosso. Given how small the sample of specimens is, true extreme dates obviously must extend much earlier and later.

Published and unpublished data other than the specimen record are consistent with findings from specimens. North of the winter range suggested by specimen records, I can find no other evidence for presence of the species during winter. Stiles and Skutch (1989), Ridgely and Gwynne (1989), and Hilty and Brown (1986) were unable to find any winter reports in Costa Rica, Panama, or Colombia (all three countries at one time considered part of the winter range). For example, in Colombia, F. Gary Stiles (pers. comm.) has seen or netted four individuals in Meta in October and November, one at Bogotá on 12 November 1991, and one at Leticia, Amazonas, on 1 November 1996; he is unaware of any winter records for Colombia. In northern Colombia, an intensive survey from October to May (Russell 1980) yielded records of Veeries only in October (4)

and November (1). In northern Venezuela, also cited as part of the winter range by many references, an eight-year banding program (M. Lentino unpubl. data) in Aragua has detected Veeries only in spring (14 April to 5 May) and fall (9 to 30 October). In 19 years in residence at a site in Miranda, northern Venezuela, Thomas (1993) had two records of Veery, both in October. In six years of year-round surveys at a site in Guárico in northern Venezuela, Thomas (1979, 1993) detected Veeries only in October, November, and May (3 May 1985). At a site in southern Venezuela sampled from late December to late April, the only records are from 22 March to 28 April (Zimmer and Hilty 1997). Trinidad is occasionally included in the winter range of the Veery (Table 1), and that is evidently based on the two records in ffrench (1991): a bird mist-netted on 19 April 1975 and a sight record on 15 October 1982; therefore, Trinidad lacks winter records by my definition. Near Manaus, Brazil, at a site surveyed intensively for 17 years (including roughly 150,000 net-hours), Stotz et al. (1992) and Cohn-Haft et al. (1997) found the Veery was a rare spring migrant (21 February to 10 April) and a casual fall migrant (three records, 3 to 28 November). Also near Manaus, a year-round survey recorded Veeries on only two dates, one in November and one in March (Willis 1977). In western Amazonian Brazil in Rondônia, also within the published winter range, Stotz et al. (1992, 1997) found the Veery was primarily an autumn migrant, with just one spring record. In western Amazonas, A. Whittaker (pers. comm.) saw two individuals at Barro Vermelho, 6°28′S, 68°45′W, on 14 October 1991. Surveys at a locality in southern Amazonian Brazil in northern Mato Grosso did not record Veeries (Zimmer et al. 1997). An undocumented sight report from French Guiana on 10 December 1991 (Tostain et al. 1992) could represent a late migrant or a wintering individual. The only record from Peru is a sight record by Mark B. Robbins on 5 November 1980 in Amazonian southeastern Peru (Parker 1982), and none of the several well-studied localities in Peru have recorded that species. In Bolivia, Davis's (1993) intensive, 2.5 year survey of a locality in south-central Bolivia (1993) yielded a single record from November, and I can find no report of that species in Bolivia during the strictly defined winter period, although Bolivia is included in the winter range by Phillips (1991) and Moskoff (1995).

From within the area from which there are winter specimens, additional observations are few, probably because that region has not been surveyed by many ornithologists (Silva 1995a). In the state of Goiás, two Veeries were netted by Eric Linder and C. Johansson on 25 February 1996 (E. Linder pers. comm.); that date is five days later than my strictly defined winter period, but if those individuals were not transients, then those records fill a critical gap between localities to the northwest and southeast. In the state of São Paulo, Brazil, Willis and Oniki (1993) and E. O. Willis (pers. comm.) recorded 13 individuals on 12 dates at 12 localities, 250 to 1,000 m, between 27 November and 11 March, primarily in secondary woodlands. Douglas F. Stotz (pers. comm.) saw a Veery at Praia Seca, east of Rio de Janeiro, on 18 January 1992, the most southeastern report so far.

Discussion

Does the specimen record truly indicate a much more restricted winter range than is currently acknowledged? Certainly the small number of specimens taken during the period here considered to represent winter signals that results must be interpreted with caution. On the other hand, empirical evidence is lacking for occurrence of Veeries outside those areas in winter. Although the actual winter range is undoubtedly larger than the area from which winter specimens have been taken, it seems extremely unlikely that it is as broad as that portrayed in current literature. In addition to absence of specimens from areas outside south-central Brazil, other types of monitoring have also failed to reveal winter populations of the Veery within the generally described winter range. Finally, concentration of specimen records in that region is not an artifact of sampling—the Amazon basin as a whole has been sampled extensively (e.g. see fig. 7.1 *in* Haffer 1974).

If the true winter range of the Veery does differ so strongly from that given in most reference works, then why and how have such errors been perpetuated? What lessons can we learn from the errors? To detect the origin of the errors, I compiled winter-range statements from various sources frequently cited, or formerly

so, for distributional information (Table 1). In the nineteenth century, the winter range was largely unknown, but with exploration of the Neotropics, Veeries began to be detected over a wide area of Central and South America in the early twentieth century. Although Central America disappeared from most range statements by the 1960s, most references converged on a winter range that included South America from the Caribbean coast of Colombia and Venezuela south to central Brazil.

Reasons for attribution of the winter range of Veeries to large areas from which it has never been recorded in winter are as follows. First, copy-cat error perpetuation explains much of the problem. Once the winter range began to be described as above, no one (other than Tyler 1949) checked the data behind such descriptions. Of course the mission of many such references, such as the various versions of the American Ornithologists' Union (AOU) Checklist, is simply to compile information from previously published synopses rather than to analyze original data.

Second, and more important conceptually, several authors did not distinguish the winter season from migration for species whose nonbreeding range was south of North America. For example, Ridgway (1907) wrote ''wintering in Costa Rica (San José; October),'' thereby revealing that he considered ''wintering'' and ''October'' as the same thing. Likewise, Snyder (1966) gave its status in Guyana as a ''winter visitor'' but only noted one specimen record, from 12 April. Meyer de Schauensee (1970) stated that it was a winter resident (''Oct.–Apr.'') in Guyana, Venezuela, northern Colombia, and Brazil south to lower Amazon and in western Mato Grosso. Meyer de Schauensee and Phelps (1978) stated that in Venezuela, the Veery was a winter resident, ''October–April probably throughout.'' Implicit in those statements is that those authors considered any record south of the breeding range to represent the winter range. Indeed, specimen records from the winter range as defined here are from as early as 1 October and as late as 4 April. Nevertheless, that does not mean that October or April records, for example, indicate that the Veery winters there, for the same obvious reasons that would block such a conclusion for October or April records from the United States. In other cases, authors ignored their own data. For example, Wetmore et al. (1984) described the status of the Veery in Panama as ''migrant and winter visitor. . . found from September to early May;'' however, in their detailed accounts, the only records that they noted were from September, October, and November. Paynter (1995) correctly noted the paucity of records from December through February from the area that he ascribed to its winter range, but then concluded that ''the species must be very difficult to encounter from December to late February.''

The third reason for errors is that almost all authors overlooked or ignored Tyler (1949), who correctly noted that records from outside true winter months were being included in the winter range and that all true winter records came from a small area in Brazil, thereby not differing substantively from my analysis 50 years later. Whether other authors did not check the ''Bent'' series for distributional information (in spite of its exceptional detail, at least for North America), or whether they ignored Tyler's analysis, is not known. One of the only authors who cited Tyler was Phillips (1991), who then, ironically, ignored the logic outlined by Tyler and extended the winter range to areas from which there are no winter specimens. Furthermore, Phillips then attributed the erroneous statements in the literature to the AOU (1957, 1983) rather than trace them to the source, namely Ridgway (1907) and others.

Is the discrepancy between data and published statements on winter range restricted to the Veery? Without similar analyses, that is unknown. However, I predict the same sort of errors affect published statements of the winter range of many species. An analogous example has already been discovered for an austral migrant in South America (Marantz and Remsen 1991). Although magnitude of such errors is likely to be greater with increasing distance between breeding and wintering ranges, failure to distinguish records pertaining to migrants from those pertaining to wintering individuals may affect even those species that winter just south of the United States in Mexico or the West Indies with respect to finer scales of geographic resolution, including elevational distribution. Detailed analyses such as those by Pashley (1988) are badly needed.

Importance of rectifying such errors is illustrated by the consequences of that error with re-

spect to the migration biology of the Veery. For example, if the true winter range as calculated here is approximately correct, then the straight-line distances that individual Veeries potentially cover in migration change from a minimum of roughly 2,800 km (northern Colombia to northern Georgia) and a maximum of 10,000 km (Mato Grosso to British Columbia) to 6,200 km (southern Pará to northern Georgia) and 11,400 km (southern São Paulo to British Columbia), increases of 120 and 14%, respectively. Interspecific comparisons of migration strategies and influences of migration on adaptive morphology depend on these variables (e.g. Berthold 1973, Yong and Moore 1994), so calculations of costs of migration must change comparably.

Such errors also have a profound and obvious influence on conservation biology of the Veery. The extent of the winter distribution of a migratory species is frequently used as a variable in assessing conservation concerns (e.g. Partners in Flight). Because actual size of the winter range of the Veery may only be 10% of the size given in current reference works, that drastically affects such prioritization systems. Worse, the true winter range may be centered in an area of South America, the cerrado region (*sensu* Silva 1995b) of southern Brazil, that is undergoing exceptionally rapid habitat destruction for agriculture (Dias 1990, Willis 1992, Silva 1995a). Although winter habitat preferences of the Veery have not been studied, it has been found primarily in second-growth woodlands (Willis and Oniki 1993), and almost certainly finds agricultural areas unsuitable. Peterjohn et al.'s (1996) summary of population trends of North American birds using Breeding Bird Survey data showed a highly significant rate of decline of 1.4% per year for the Veery for 1966–1995 (1.2% per year through 1999; Sauer et al. 2000). Even using the broad winter range of the Veery, Rappole (1995, table 9.3) considered the Veery as having a ''high probability of showing declines in the next decade'' due to winter habitat loss. Therefore, conservation status of the Veery with respect to habitat destruction within the winter range should shift from relative complacency to immediate concern. More information on relative abundance of this species among habitats and regions within its rather small winter range is badly needed.

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Literature Cited

American Ornithologists' Union. 1886. Checklist of North American Birds. American Ornithologists' Union, New York.

American Ornithologists' Union. 1895. Checklist of North American Birds, 2nd ed. American Ornithologists' Union, New York.

American Ornithologists' Union. 1910. Checklist of North American Birds, 3rd ed. American Ornithologists' Union, New York.

American Ornithologists' Union. 1931. Checklist of North American Birds, 4th ed. American Ornithologists' Union, Lancaster, Pennsylvania.

American Ornithologists' Union. 1957. Checklist of North American Birds, 5th ed. Lord Baltimore Press, Baltimore, Maryland.

American Ornithologists' Union. 1983. Checklist of North American Birds, 6th ed. American Ornithologists' Union, Washington, D.C.

American Ornithologists' Union. 1998. Checklist of North American Birds, 7th ed. American Ornithologists' Union, Washington, D.C.

BAIRD, S. F. 1872. Review of American Birds in the Museum of the Smithsonian Institution, part I. Smithsonian Institution, Washington, D.C.

BARLOW, J. C. 1980. Patterns of ecological interactions among migrant and resident vireos on the wintering grounds. Pages 79–108 *in* Migrant Birds in the Neotropics (A. Keast and E. S. Morton, Eds.). Smithsonian Institution Press, Washington, D.C.

BERTHOLD, P. 1973. Relationships between migratory restlessness and migration distance in six *Sylvia* species. Ibis 115:594–599.

BÖHNING-GAESE, K., M. L. TAPER, AND J. H. BROWN. 1993. Are declines in North American insectivorous songbirds due to causes on the breeding range? Conservation Biology 7:76–86.

COHN-HAFT, M., A. WHITTAKER, AND P. C. STOUFFER. 1997. A new look at the ''species-poor'' central Amazon: Updates and corrections to the avifauna north of Manaus, Brazil. Ornithological Monographs 48:205–235.

COUES, E. 1884. Key to North American Birds, 2nd ed. Estes and Lauriat, Boston.

CRAMP, S., ED. 1988. Handbook of the Birds of Europe the Middle East and North Africa, vol. 5. Tyrant Flycatchers to Thrushes. Oxford University Press, Oxford.

DAVIS, S. E. 1993. Seasonal status, relative abundance, and behavior of the birds of Concepción, departamento Santa Cruz, Bolivia. Fieldiana (Zoology), New Series, no. 71.

DIAS, B. F. DES. 1990. Conservação da natureza no cerrado Brasileiro. Pages 583–640 *in* Cerrado: Caracterização, Ocupação e Perspectivas (M. N. Pinto, Ed.). Editora Universidade Brasília, Distrito Federal, Brazil.

DUGAND, A. 1947. Aves del departamento del Atlántico, Colombia. Caldasia 4:497–698.

DUNN, J., AND K. GARRETT. 1983. The identification of the thrushes of the genus *Catharus*, part 4: Veery and Gray-cheeked Thrush. Western Tanager 49:1–3.

FITZPATRICK, J. W. 1980. Wintering of North American tyrant flycatchers in the Neotropics. Pages 67–78 *in* Migrant Birds in the Neotropics (A. Keast and E. S. Morton, Eds.). Smithsonian Institution Press, Washington, D.C.

FFRENCH, R. 1991. A Guide to the Birds of Trinidad and Tobago, 2nd ed. Comstock Publishing, Ithaca, New York.

GODFREY, W. E. 1966. The Birds of Canada. National Museum of Canada, Ottawa, Ontario.

GODFREY, W. E. 1986. The Birds of Canada, 2nd ed. National Museum of Natural Sciences, Ottawa, Ontario.

HAFFER, J. 1974. Avian speciation in tropical South America. Publications of the Nuttall Ornithological Club, no. 14.

HELLMAYR, C. E. 1934. Catalogue of birds of the Americas and the adjacent islands, part 7. Field Museum of Natural History, Zoological Series 8.

HILTY, S. L., AND W. L. BROWN. 1986. A Guide to the Birds of Colombia. Princeton University Press, Princeton, New Jersey.

HOWELL, S. N. G., AND S. WEBB. 1995. A Guide to the Birds of Mexico and Northern Central America. Oxford University Press, New York.

KEAST, A. 1980. Spatial relationships between migratory parulid warblers and their ecological counterparts in the Neotropics. Pages 109–130 *in* Migrant Birds in the Neotropics (A. Keast and E. S. Morton, Eds.). Smithsonian Institution Press, Washington, D.C.

LANE, D. F., AND A. JARAMILLO. 2000. Field identification of *Hylocichla/Catharus* thrushes, part II: Veery and Swainson's Thrush. Birding 32:242–254.

MCFARLANE, R. W. 1974. Unusual avian migrants in Tarapacá. IDESIA (Chile) 3:181–184.

MARANTZ, C. A., AND J. V. REMSEN, JR. 1991. Seasonal distribution of the Slaty Elaenia (*Elaenia strepera*), a little-known austral migrant of South America. Journal of Field Ornithology 62:162–172.

MEYER DE SCHAUENSEE, R. 1964. The Birds of Colombia. Livingston Publishing Company, Narberth, Pennsylvania.

MEYER DE SCHAUENSEE, R. 1966. The Species of Birds of South America and their Distribution. Livingston Publishing Company, Narberth, Pennsylvania.

MEYER DE SCHAUENSEE, R. 1970. A Guide to the Birds of South America. Livingston Publishing Company, Wynnewood, Pennsylvania.

MEYER DE SCHAUENSEE, R., AND W. H. PHELPS, JR. 1978. A Guide to the Birds of Venezuela. Princeton University Press, Princeton, New Jersey.

MORSE, D. H. 1980. Population limitation: Breeding or wintering grounds?. Pages 503–516 *in* Migrant Birds in the Neotropics (A. Keast and E. S. Morton, Eds.). Smithsonian Institution Press, Washington, D.C.

MOSKOFF, W. 1995. Veery (*Catharus fuscescens*). *In* The Birds of North America, no. 141 (A. Poole and F. Gill, Eds.). Academy of Natural Sciences, Philadelphia, and American Ornithologists' Union, Washington, D.C.

ODUM, E. P., C. E. CONNELL, AND H. L. STODDARD. 1961. Flight energy and estimated flight ranges of some migratory birds. Auk 78:515–527.

PARKER, T. A. III. 1982. Observations of some unusual rainforest and marsh birds in southeastern Peru. Wilson Bulletin 94:477–493.

PASHLEY, D. N. 1988. Warblers of the West Indies. I. The Virgin Islands. Caribbean Journal of Science 24:11–22.

PAYNTER, R. A., JR. 1995. Nearctic passerine migrants in South America. Publications of the Nuttall Ornithological Club, no. 25.

PEREIRA, L. E., L. DE A. SACCHETTA, AND D. M. DE SOUZA. 1988. *Catharus fuscescens* (Stephens, 1817), nova espécie para o estado de São Paulo. Anais do III Enav:111–112.

PETERJOHN, B. G., J. R. SAUER, AND W. A. LINK. 1996. The 1994 and 1995 summary of the North American breeding bird survey. Bird Populations 3: 48–66.

PETERSON, R. T. 1980. A Field Guide to the Birds, 4th ed. Houghton Mifflin, Boston.

PHILLIPS, A. R. 1991. The Known Birds of North and Middle America, part II. A. R. Phillips, Denver, Colorado.

RAPPOLE, J. H. 1995. The Ecology of Migrant Birds. Smithsonian Institution Press, Washington, D.C.

RAPPOLE, J. H., AND M. V. MCDONALD. 1994. Cause and effect in population declines of migratory birds. Auk 111:652–660.

RAPPOLE, J. H., E. S. MORTON, T. E. LOVEJOY III, AND J. L. RUOS. 1983. Nearctic Avian Migrants in the Neotropics. U.S. Fish and Wildlife Service, Washington, D.C.

RIPLEY, S. D. 1964. Subfamily Turdinae. Pages 13–227 *in* Check-list of Birds of the World, vol. X (E. Mayr and R. A. Paynter, Jr., Eds.). Museum of Comparative Zoology, Cambridge, Massachusetts.

RIDGELY, R. S., AND J. A. GWYNNE. 1989. A Guide to the Birds of Panama, with Costa Rica, Nicaragua, and Honduras, 2nd ed. Princeton University Press, Princeton, New Jersey.

RIDGELY, R. S., AND G. TUDOR. 1989. The Birds of South America, vol. 1. University of Texas Press, Austin.

RIDGWAY, R. 1907. The birds of North and Middle America. Bulletin U.S. National Museum, no. 50, part 4.

ROBBINS, M. B., R. C. FAUCETT, AND N. H. RICE. 1999. Avifauna of a Paraguayan cerrado locality: Parque Nacional Serranía San Luis, depto. Concepción. Wilson Bulletin 111:216–228.

ROOT, T. 1988. Atlas of Wintering North American Birds. University of Chicago Press, Chicago.

RUSSELL, S. M. 1980. Distribution and abundance of North American migrants in lowlands of northern Colombia. Pages 249–264 *in* Migrant Birds in the Neotropics (A. Keast and E. S. Morton, Eds.). Smithsonian Institution Press, Washington, D.C.

SAUER, J. R., J. E. HINES, I. THOMAS, J. FALLON, AND G. GOUGH. 2000. The North American Breeding Bird Survey, Results and Analysis 1966–1999, version 98.1, U.S. Geological Survey, Patuxent Wildlife Research Center, Laurel, Maryland.

SIBLEY, C. G., AND B. L. MONROE, JR. 1990. Distribution and Taxonomy of Birds of the World. Yale University Press, New Haven, Connecticut.

SILVA, J. M. C. 1995a. Avian inventory of the cerrado region, South America: Implications for biological conservation. Bird Conservation International 5:291–304.

SILVA, J. M. C. 1995b. Birds of the cerrado region, South America. Steenstrupia 21:69–92.

SNYDER, D. E. 1966. The Birds of Guyana. Peabody Museum, Salem, Massachusetts.

STILES F. G., AND A. F. SKUTCH, 1989. A Guide to the Birds of Costa Rica. Comstock Publishing Associates, Ithica, New York.

STOTZ, D. F., R. O. BIERREGAARD, M. COHN-HAFT, P. PETERMANN, J. SMITH, A. WHITTAKER, AND S. V. WILSON. 1992. The status of North American migrants in central Amazonian Brazil. Condor 94: 608–621.

STOTZ, D. F., J. W. FITZPATRICK, T. A. PARKER III, AND D. K. MOSKOVITS. 1997. Neotropical Birds. Ecology and Conservation. University of Chicago Press, Chicago.

THOMAS, B. T. 1979. The birds of a ranch in the Venezuelan llanos. Pages 213–232 *in* Vertebrate Ecology in the Northern Neotropics (J. F. Eisenberg, Ed.). Smithsonian Institution Press, Washington, D.C.

THOMAS, B. T. 1993. North American migrant passerines at two non-forested sites in Venezuela. Journal of Field Ornithology 64:549–556.

TOSTAIN, O., J. L. DUJARDIN, C. ÉRARD, AND J.-M. THIOLLAY. 1992. Oiseaux de Guyane. Société d'Études Ornithologiques, Brunoy, France.

TYLER, W. M. 1949. *Hylocichla fuscescens fuscescens* (Stephens). Veery. Pages 217–231 *in* Life Histories of North American Thrushes, Kinglets, and their Allies (A. C. Bent, Ed.). U.S. National Museum Bulletin, no. 196.

WETMORE, A., R. F. PASQUIER, AND S. L. OLSON. 1984. The Birds of the Republic of Panamá. Part 4. Smithsonian Miscellaneous Collections, vol. 150.

WILLIS, E. O. 1977. Lista preliminar das aves da parte noroeste e áreas vizinhas da Reserva Ducke, Amazonas, Brazil. Revista Brasileira de Biologia 37:585–601.

WILLIS, E. O. 1992. Losses of São Paulo birds are worse in the interior than in Atlantic forests. Ciencia e Cultura 44:326–328.

WILLIS, E. O., AND Y. ONIKI. 1993. New and reconfirmed birds from the state of São Paulo, Brazil, with notes on disappearing species. Bulletin of the British Ornithologists' Club 113:23–34.

YONG, W., AND F. R. MOORE. 1994. Flight morphology, energetic condition, and the stopover biology of migrating thrushes. Auk 111:683–692.

ZIMMER, K., AND S. L. HILTY. 1997. Avifauna of a locality in the upper Orinoco drainage of Amazonas, Venezuela. Ornithological Monographs 48:865–885.

ZIMMER, K., T. A. PARKER III, M. P. ISLER, AND P. ISLER. 1997. Survey of a southern Amazonian avifauna: The Alta Floresta region, Mato Grosso, Brazil. Ornithological Monographs 48:887–918.

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APPENDIX. Specimen records ($N = 101$) of Veeries (*Catharus fuscescens*) from South America. Within each country, specimens are organized by state or departamento, followed by date, sex (''u'' = unknown), locality, museum (see Acknowledgments for codes), and catalog number.

COLOMBIA

Atlántico:

4 Sep. 1939 (u), Los Pendales, 20 m (USNM 361386; Dugand 1947)

Magdalena:

1 Oct. 1964 (♂), Bella Vista, Sierra Nevada de Santa Marta, 1,000 m (MVZ 154650); 7 Oct. 1898 (u), Bonda (AMNH 70417); 8 Oct. 1898 (u), Bonda (AMNH 70418); 8 Oct. 1900 (♀), Bonda (CM 9020); 26 Oct. 1959 (♀), Bonda (LSUMZ 47161); 27 Oct. 1959 (♀), Bonda (WFVZ 11747)

Norte de Santander:

23 Oct. 1944 (u), Pamplona, 6,900 ft. (ANSP 157508); 23 Oct. 1944 (u), Pamplona, 6,900 ft. (ANSP 157509)

Arauca:

27 Apr. 1991, (♂) Caño Limón (ICN 31021)

Santander:

7 Oct. 1979, Charalá, 1,870 m (MNC, Bogotá 25295); 18 Oct. 1946 (♀), Ocana, 3,800 ft. (USNM 398773); 11 Nov. 1964 (♀), Bucaramanga, 1,050 m (MVZ 154651); 1 Dec. 1979, (♀) Charalá, 1,800 m (ICN 25925)

Boyacá:

27 Oct. 1972, (♀) Sogamoso (ICN 21557); 21 Apr. 1917 (♂), Palmar (CM 60539)

Cundinamarca:

22 Oct. 1986, (♂) Bogotá (ICN 28984)

VENEZUELA

Aragua:

19 Apr. 1946 (u), Rancho Grande (AMNH 80604)

Táchira:

15 Oct. 1967 (♀), Las Mesas, 480 m (COP 68414)

Mérida:

18 Aug. 1922 (♂), Conejos, 3,000 m (ROM 53054); 28 Sep. 1903 (♂), La Culata, 3,000 m (AMNH 503767); 14 Oct. 1904 (♀), Escorial, 3,000 m (AMNH 439491); 20 Oct. 1910 (♂), La Culata (BM 1914.11.26.742); 21 Oct. 1907 (♂), Escorial (BM 1914.11.26.741); 24 Oct. 1903 (♀), Escorial, 3,000 m (AMNH 503768); 11 Nov. 1902 (♂), Escorial, 3,000 m (ROM 53038); 18 Nov. 1903 (♂), Mérida (AMNH 377042); 4 Mar. 1914 (♀), Escorial, 3,000 m (ROM 53059); 10 Mar. 1888 (u), La Culata (''Berlepsch Collection''; Hellmayr 1934); 20 Mar. 1904 (♀), Escorial, 2,500 m (AMNH 503769)

Lara:

26 Oct. 1987 (u), Terepaima, 1,250 m (COP 76197)

Apure:

20 Oct. 1965 (♀), Barbacon, R. Meta (COP 67152)

Carabobo:

22 Oct. 1942 (♂), Colonia Chirgua, 800 m (COP 19841); 22 Oct. 1942 (u), Colonia Chirgua, 850 m (COP 19842); 29 Apr. 1914 (♂), El Trompillo, 1,200 ft. (CM 46435)

Portuguesa:

19 Apr. 1939 (♂), Guanare, 200 m (COP 2973)

Sucre:

8 Nov. 1951 (♂), Cumbre C. Papelón, 920 (COP 56609)

Amazonas:

6 Mar. 1972 (♀), Frontera, 1,050 m (COP 71455); 19 Mar. 1943 (♂), San Fernando de Atabapo, 160 m (COP 22071); 4 Apr. 1984 (♂), base camp, Cerro de la Neblina, 140 m (FMNH 319600); Nov. 1928 (♂), Valle de los Monos, Mt. Duida (AMNH 275150); 11 Mar. 1945 (♂), Salto Maisa, Alto Río Paragua, 320 m (COP 30526); 23 Mar. 1946 (u), Camp. La Cruz, Yavita, Pimichín, 150 m (COP 34698); 25 Mar. 1945 (♂), Salto María Espuma, Caño Espuma, Río Paragua, 300 m (COP 30527); 7 Apr. 1945 (♂), Edal. Capuri, Caño Antabari, Río Paragua, 300 m (COP 30526)

GUYANA

1 Apr. 1882 (♂), Camacusa (BM 1885.3.2.70); 12 Apr. 1882 (u), Camacusa (BM 1885.3.2.71)

BRAZIL

Amazonas:

10 Oct. 1988 (♀), Munic. Maraã, frenta loc. Maguari, right bank Rio Japurá, ca. 01°50′S, 65°20′W (MPEG 43340); 16 Oct. 1965 (♂), Tapuruquara, Rio Negro (MNRJ 29681); 19 Oct. 1959 (♂), Estirão do Ecuador, Rio Javarí (MPEG 16727); 23 Oct. 1959 (♂), Estirão do Ecuador, Rio Javarí (MNRJ 29005); 23 Oct. 1991 (♂), Humaitá, BR-819, Km 20 (MPEG 49571); 6 Nov. 1991 (♂), Humaitá, BR-130, Km 8 (MPEG 49570); 11 Nov. 1974 (u), Estrada Jacaréacanga-Humaitá, Km 969 Rio 9 de Janeiro, right bank Rio Madeira (MPEG 30867); 8 Mar. 1924 (♂), Ilha Marricão, Manacapurú (CM 60539)

Roraima:

9 Mar. 1987 (♂), Ilha de Maracá, Rio Uraricoera (MPEG 39213); 26 Mar. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46174); 29 Mar. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46175); 6 Apr. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46176); 6 Apr. 1990 (♀), Colonia do Apiaú, Mucajaí (MPEG 46184); 7 Apr. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46177); 7 Apr. 1990 (♂), Colonia do Apiaú, Mucajaí

(MPEG 46178); 7 Apr. 1990 (♀), Colonia do Apiaú, Mucajaí (MPEG 46185); 14 Apr. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46179); 14 Apr. 1990 (♀), Colonia do Apiaú, Mucajaí (MPEG 46186); 15 Apr. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46180); 18 Apr. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46181); 18 Apr. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46182); 18 Apr. 1990 (♂), Colonia do Apiaú, Mucajaí (MPEG 46183); 19 Apr. 1990 (♀), Colonia do Apiaú, Mucajaí (MPEG 46187)

Rondônia:

22 Oct. 1986 (♀), Cachoeiro Nazaré, Rio Ji-paraná (MPEG 40263); 27 Oct. 1986 (♂), Cachoeiro Nazaré, Rio Ji-paraná (MPEG 40260); 29 Oct. 1986 (♂), Cachoeiro Nazaré, Rio Ji-paraná (MPEG 40259); 4 Nov. 1986 (♂), Cachoeiro Nazaré, Rio Ji-paraná (MPEG 40258); 2 Nov. 1986 (♀), Cachoeiro Nazaré, Rio Ji-paraná (MPEG 40262); 4 Nov. 1986 (♀), Cachoeiro Nazaré, Rio Ji-paraná (MPEG 40261); 6 Nov. 1954 (♂), Porto Velho, Madeira River (MZUSP 37996); 19 Nov. 1986 (♂), Cachoeiro Nazaré, Rio Ji-paraná (MPEG 40257)

Pará:

2 Nov. 1955 (♀), Itaituba, Rio Tapajos (MPEG 15461); 15 Jan. 1985 (♀), Serro Norte, Carajás, 700 m (MPEG 36829); 15 Jan. 1985 (♀), Serro Norte, Carajás, 700 m (MPEG 36830); 15 Jan. 1985 (♀), Serro Norte, Carajás, 700 m (MPEG 36831)

Mato Grosso:

19 Dec. 1928 (♂), Burity, Cuiabá (MNRJ 16260); 28 Dec. 1952 (♂), Garapu, upper Xingu River (MNRJ 36521); 10 Jan. 1987 (♀), Buriti, Chapada dos Gumares (MPEG 38941); 10 Jan. 1987 (♀), Buriti, Chapada dos Gumares (MPEG 38942); 12 Jan. 1987 (♀), Buriti, Chapada dos Gumares (MPEG 38940); 13 Jan. 1987 (♂), Buriti, Chapada dos Gumares (MPEG 38938); 16 Jan. 1883 (♀), Chapada (BM 1889.1.10.2); 31 Jan. 1883 (♂), Chapada (BM 1889.1.10.1); 14 Feb. 1883, Chapada (MNRJ 16260); 21 Feb. 1883 (♂), Chapada (AMNH 30922); 27 Mar. 1883 (♂), Chapada (AMNH 30923); 4 Apr. 1882 (u), Chapada (AMNH 30921)

Minas Gerais:

17 Nov. 1987 (♀), Fazenda Tira-Teima, Arinas, ca. 15°55′s, 46°05′W (MPEG 41501)

São Paulo:

9 Dec. 1986 (♀), Municipio de Iguapé (Inst. Adolfo Lutz 16579; Pereira et al. 1988); 30 Jan. 1985 (♂), Estação de Campo de Casa Grande, Municipio de Salesópolis (Inst. Adolfo Lutz 12725; Pereira et al. 1988)

BOLIVIA

Cochabamba:

9 Nov. 1937 (♂), Cochabamba (FMNH 181674)

Santa Cruz:

25 Nov. 1985 (♂), 8 km SW Zapacoz, 450 m, prov. Ñuflo de Chavez (FMNH 335344); 2 Mar. 1973 (♀), Santiago de Chiquitos, 700 m (FMNH 295425); 4 Mar. 1973 (♂), Santiago de Chiquitos, 700 m (FMNH 295427); 10 Mar. 1973 (♂), Santiago de Chiquitos, 700 m (FMNH 295426); 10 Mar. 1973 (♀), Santiago de Chiquitos, 700 m (FMNH 295426); 10 March 1945 (♂), Buena Vista, 400 m (LSUMZ 38077)

PARAGUAY

Concepcion

30 Oct. 1996 (♂), Serranía San Luis (KU 88484); see Robbins et al. (1999)

CHILE

Arica:

17 Mar. 1973 (♂), Chapisca, Valle de Lluta, Comuna de Arica, 1,010 m (MNHN 4445); see MacFarlane (1974).