Wetlands INTERNATIONAL

IUCN SSC Species Survival Commission

Newsletter

Number 45 December 2020

Tail sounds and vocalizations suggest that the South American Snipe comprises two species

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Introduction

Readers of this newsletter will be familiar with the non-vocal "drumming" or "winnowing" sound of breeding male snipe in their aerial displays. The sound and display of Common Snipe (*Gallinago gallinago*) in aerial display have been well-described by Reddig (1978, 1981); good compilations also exist for that species (Glutz von Blotzheim *et al.* 1977, Cramp 1983). Differences between the "winnow" sound of Common Snipe and Wilson's Snipe (*G. delicata*; Bahr 1907, Thönen 1969, Miller 1996) were part of the reason for elevating those forms from subspecies to species status (Banks *et al.* 2002, Knox *et al.* 2008). In addition, Common Snipe and Wilson's Snipe differ in size of the outer rectrices (Bahr 1907, Tuck 1972), which produce the "winnow" sound when males dive in their display flights. The species also differ in how outer rectrices are spread during sound production, a point that has been noted rarely: Common Snipe spread only the single outermost rectrices to ~90º to the side, whereas Wilson's Snipe do the same but also spread the next one or two rectrices (Paulson 2005; for other images see Bahr 1907, Glutz von Blotzheim *et al.* 1977, Reddig 1978, and O´Brien *et al.* 2006; Figure 1).

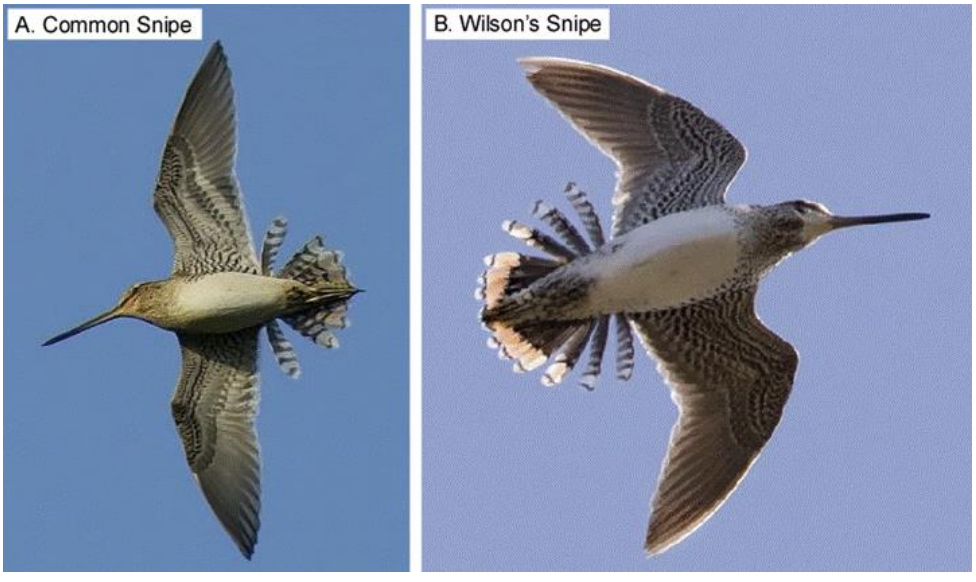

Figure 1. Male Common Snipe (A) and Wilson's Snipe (B) in breeding-season aerial displays, showing the difference between how rectrices are spread when rectrix-generated "winnow" sounds are produced during dives. A -- Narew National Park, Poland (53º05'N 22º53'E), 6 May 2017. Photograph by Stanislav Harvančík (Internet Bird Collection IBC1375917). B -- Seward Peninsula, Alaska (64º37'N 165º17'W), 30 May 2016. Photograph by Lars Petersson (IBC1294368).

The striking difference between Common Snipe and Wilson's Snipe in the tail-generated "winnow" sounds (and in how tail feathers are spread) prompted us to consider whether there are other cases of unrecognized snipe species. Our attention was drawn immediately to the South American Snipe (*G. paraguaiae*) because: (a) it breeds over an unusually large and ecologically diverse geographic range, from tropical areas in northern South America to southernmost Patagonia east of the Andes, and north to at least Santiago, Chile, west of the Andes; and (b) two distinctive subspecies are recognized (*paraguaiae*, *magellanica*), separated in Argentina by the Monte Desert. In addition, some workers have considered that the taxa represent different species (e.g. Piersma 1996). Jaramillo (2003: 227) noted that the subspecies differ in their "winnow" sound and predicted that further study, incorporating acoustic analysis, would confirm that the two forms are different species. Therefore we investigated "winnow" sounds of the South American Snipe, and included main breeding-season ground calls.

Methods

We recorded South American Snipe in several South American countries, and analyzed those plus others in sound archives or online. We included the closely related Puna Snipe (*G. andina*) in our study. For all species, we recorded "winnow" sounds only by birds displaying by themselves, i.e. not flying closely beside and diving in parallel with possible females, as many observers suggest that females can produce "winnow" sounds in such circumstances (*e.g.* Bahr 1907, Manson-Bahr 1931). For details about recordings and analyses, see Miller *et al.* (2019). For the present article, we prepared spectrograms in Raven Pro 64 1.5 (www.birds.cornell.edu/raven).

Results

The Winnow of *G. p. paraguaiae* is a series of sound elements that gradually increase in duration and energy; that of *G. p. magellanica* usually has two (sometimes more) kinds of sound element that roughly alternate and are repeated as couplets, which imparts a distinctive stuttering quality (Figure 2).

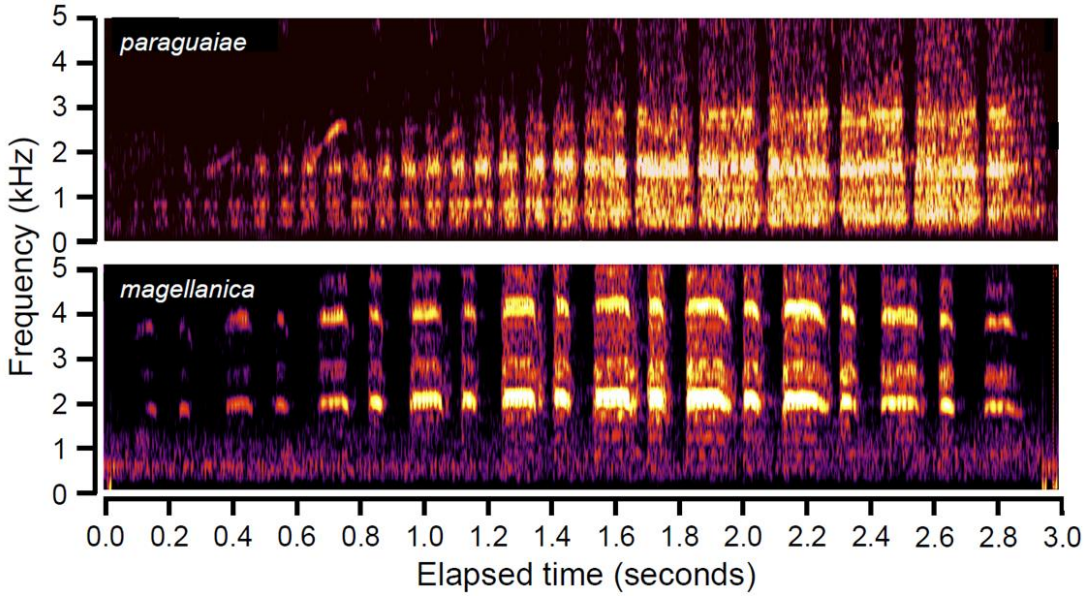

Figure 2. "Winnow" sounds of South American Snipe, subspecies paraguaiae (upper) and magellanica (lower) in breeding-season aerial displays, shown as spectrograms (frequency ("pitch") x time). The sound of G. p. paraguaiae is a series of broadband pulses that increase gradually in duration and amplitude ("loudness") over each "winnow", until just before its end. That of G. g. magellanica is a series of pulses that similarly increase in duration and amplitude over the sound, but show sharper frequency bands and are organized as multiples (couplets, in this example) of pulses that vary in duration. G. p. paraguaiae -- Ñeembucú, Paraguay (25°06'S 57°48'W), 15 November 2008. Recording by Edward H. Miller. G. p. magellanica – Magallanes, Chile (53°10'S 70°55'W), 24 October 2004. Recording by Edward H. Miller.

Both *G. p. paraguaiae* and *G. p. magellanica* utter two types of ground call. In the former, the calls are bouts of identical sound elements repeated rhythmically and slowly (about 5 elements per sec [Hz]; "slow chip") or rapidly (about 11 Hz; "fast chip"; Fig. 3, upper two panels, respectively). One call of *G. p. magellanica* is qualitatively similar to "chip" calls of *G. p. paraguaiae* but sound elements are repeated more slowly (at about 3 Hz; Fig. 3, third panel). The other type of call of *G. p. magellanica* differs greatly: it is a bout of rhythmically repeated sound couplets, each containing two kinds of sound element ("chipper"; Figure 3, bottom panel).

The "winnow" and calls of Puna Snipe resemble those of *G. p. paraguaiae* more than *G. p. magellanica*; however our small sample size of calls included only one call type (see Discussion).

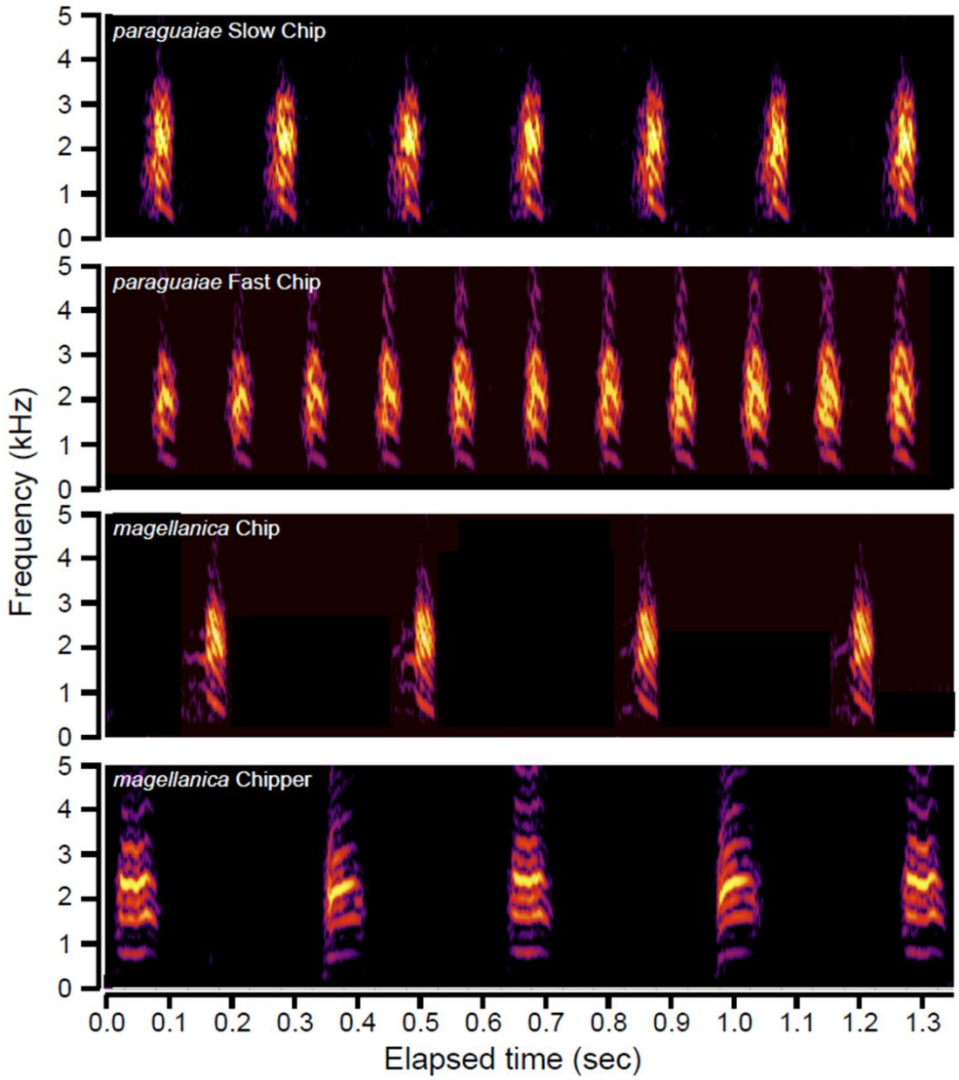

Figure 3. The two subspecies of South American Snipe differ in their ground calls both quantitatively and qualitatively. paraguaiae utters "slow chip" and "fast chip" calls (upper two panels, respectively). magellanica also has two kinds of call, one ("chip") resembling those of paraguaiae, but the other ("chipper") consisting of two alternating types of call (third and bottom panels, respectively). Top panel. Rio Grande do Sul, Brazil (32°7'S 52°13'W), 1 August 2008. Recording by Nick Athanas (xeno-canto #22080). Second panel, Chaco, Argentina (26°0'S 59°0'W), 15 May 2015. Recording by Juan Ignacio Areta. Third panel. Chiloé (Isla, Chile (41°48'S 73°55W), 1 September 2006. Recorded by Edward H. Miller. Bottom panel. Malvinas/Falkland Islands (51°15'S 60°34'W), 15 December 2010. Recorded by Laurent Demongin (International Bird Collection #1127147).

Discussion

Differences in aerial "winnow" displays and ground calls of breeding *G. p. paraguaiae* and *G. p. magellanica* are strong and consistent from samples taken throughout the geographic ranges of the two subspecies. The differences are greater than between other closely related snipe taxa that are recognized as species (*e.g.* Common Snipe and Wilson's Snipe; South American Snipe and Puna Snipe (Jaramillo 2003, Miller *et al.* 2019). Therefore we suggested that the two taxa be considered as different species: *G. paraguaiae* east of the Andes in much of South America except Patagonia, and *G. magellanica* in central and southern Chile, Argentina east of the Andes across Patagonia, and Falklands/Malvinas (Miller *et al.* 2019).

Recommendations for future research

Several lines of investigation would be valuable to build on our findings. First, sexual differences in usage and physical properties of ground calls would substantially improve understanding of the taxonomic differences we found, as we did not know the sex, social context, or breeding state of the birds that we (or other workers) recorded. In fact this is true of almost all sound recordings of all species of snipe. Therefore the actual species differences may be much greater than those we documented if analyses were restricted to males, for example. A detailed study on marked breeding birds of *paraguaiae* or *magellanica*, or perhaps even of related *Gallinago* species like *delicata*, *gallinago*, *macrodactyla*, or *nigripennis*, would illuminate this matter.

A second line of investigation is suggested by the difference between Common Snipe and Wilson's Snipe in how the tail is spread during production of the "winnow" sound. Very few good photographs of other snipe species in aerial display are available. The availability of good photographs would be informative about how widespread are species differences in how rectrices are spread, and in the number and size of rectrices. The only species for which there are both good photographs and good information about rectrices are Common Snipe and Wilson's Snipe. In the former species, males usually possess 14 rectrices; in the latter, males usually have 16. In addition, the outer rectrix is longer and wider in the Common Snipe (Bahr 1907, Tuck 1972). The outer rectrices also differ in size and shape among *G. p. paraguaiae*, *G. p. magellanica*, and Puna Snipe, being longest in *G. p. magellanica* and widest in Puna Snipe (Tuck 1972). How do other outer rectrices differ between species? Are there structural differences in the "winnow" that parallel species differences in tail-spreading or number of rectrices (Figure 4)?

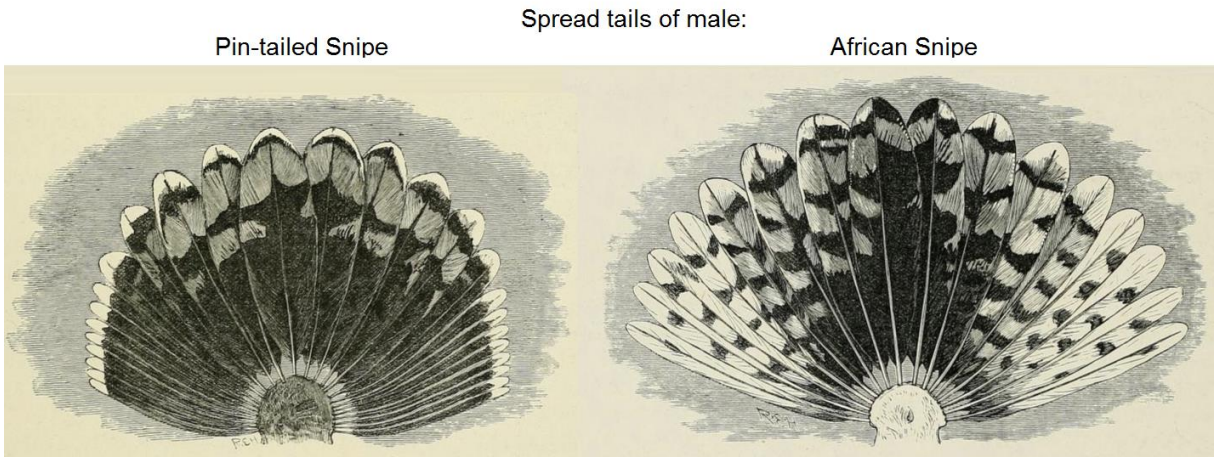

Figure 4. Tail feathers of snipe vary greatly in markings, number, and size. Our understanding of the characteristics and roles in generation of "winnow" sounds of snipe would be advanced by photography of aerially displaying birds and detailed investigations of rectrices in different species. Images from Seebohm (1888: 477 and 500, respectively).

References

Bahr, P.H. 1907. On the "bleating" or "drumming" of the snipe (*Gallinago coelestis*). *Proceedings of the Zoological Society of London* 1907: 12-35.

Banks, R.C., Cicero, C., Dunn, J.L., Kratter, A.W., Rasmussen, P.C., Remsen Jr., J.V., Rising, J.D. & Stotz, D.F. 2002. Forty-third supplement to the American Ornithologists' Union Check-List of North American Birds. *Auk* 119: 897–906.

Cramp, S. (ed) 1983. Handbook of the Birds of Europe the Middle East and North Africa. The Birds of the Western Palearctic. Vol. 3: Waders to Gulls. Oxford, U. K.: Oxford University Press.

Glutz von Blotzheim, U.N., Bauer, K.M. & Bezzel, E. (eds). 1977. Handbuch der Vögel Mitteleuropas, Band 7: Charadriiformes (2. Teil). Wiesbaden, Germany: Akademische Verlagsgesellschaft.

Jaramillo, A. 2003. Birds of Chile. Princeton, NJ: Princeton University Press.

Knox, A.G., Collinson, J.M., Parkin, D.T., Sangster, G. & Svensson, L. 2008. Taxonomic recommendations for British birds: fifth report. *Ibis* 150: 833–835.

Manson-Bahr P.H. 1931. On the breeding displays of certain waders, with special reference to the snipe family. *Bulletin of the British Ornithologists' Club* 51:84-99.

Miller, E.H. 1996. Acoustic differentiation and speciation in shorebirds. In Kroodsma, D.E. & Miller, E.H. (eds) Ecology and Evolution of Acoustic Communication in Birds: 241-257. Ithaca, NY: Cornell University Press.

Miller, E.H., J. I. Areta, A. Jaramillo, S. Imberti, and R. Matus 2019. Snipe taxonomy based on vocal and non-vocal sound displays: the South American Snipe is two species. *The Ibis* (in press; accepted 16 October 2019).

O'Brien, M., Crossley, R. & Karlson, K. 2006. The Shorebird Guide. Boston, MA: Houghton Mifflin.

Paulson, D.R. 2005. Shorebirds of North America: The Photographic Guide. Princeton, NJ: Princeton University Press.

Piersma, T. 1996. Family Scolopacidae (sandpipers, snipes and phalaropes). In del Hoyo, J., Elliott, A. & Sargatal, J. (eds) Handbook of the Birds of the World, Volume 3. Hoatzin to Auks: 444-487. Barcelona, Spain: Lynx Edicions.

Reddig, E. 1978. Der Ausdrucksflug der Bekassine (*Capella gallinago gallinago*). *Journal für Ornithologie* 119: 357-387.

Reddig, E. 1981. Die Bekassine *Capella gallinago.* Wittenberg Lutherstadt, Germany: Die Neue Brehm-Bucherei, A. Ziemsen Verlag.

Seebohm, H. 1888. The Geographical Distribution of the family Charadriidae, or the plovers, sandpipers, snipes, and their allies. London, England: Henry Sotheran and Co.

Thönen, W. 1969. Auffallender Unterschied zwischen den instrumentalen Balzlauten der europaischen und nordamerikaneschen Bekassine *Gallinago gallinago*. *Ornithologischer Beobachter* 66: 6-13.

Tuck, L.M. 1972. The Snipes: A Study of the Genus *Capella.* Monograph Series No. 5. Ottawa, ON: Canadian Wildlife Service.