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What is the northernmost breeding range of Fuegian Snipe *Gallinago stricklandii*?

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SUMMARY.—Fuegian Snipe *Gallinago stricklandii* is a poorly known wader found in southern Chile and south-west Argentina, but knowledge of its distribution is still incomplete. Historical records suggest a breeding range between 48°S and 56°S in the Patagonian fjords, however especially few data are available for the north of its presumed distribution. Here we report two records of Fuegian Snipe during the breeding season at 46°S and 48°S. We captured two individuals at Ventisquero Jorge Montt (48°19'S) in early December 2021 (late spring), both with a dry and shrivelled incubation patch, usually indicative of a recently completed incubation period. We also report a photo record and displays at the río Exploradores (46°19'S, 73°24'W). These findings suggest that the northern limit of the species' breeding range extends to at least 46°S.

The genus *Gallinago* comprises 18 species (Remsen *et al.* 2022), eight of which occur in the Neotropics. Species of this genus are almost ubiquitously poorly known (van Gils & Wiersma 1996), however Fuegian Snipe *G. stricklandii* is probably the least known of all (Ferrand 2006, van Gils *et al.* 2020). Information on many aspects of its natural history is very scarce, and even its distribution is not well known (Reynolds 1935, Kusch & Marín 2010, Matus 2018). Its known range during the breeding season extends throughout the remote southern channels and fjords of Chile and Argentina in southern Patagonia, including islands further from the mainland such as the archipelagos of Cape Horn, Staten Island, and Falkland/Malvinas Islands (Bennett 1926, Schmitt 2017, Woods 2017, Matus 2018), this last somewhat ambiguously and without evidence (*cf.* Woods 2017). Because records during the non-breeding season are scarce, it is unclear if the species undertakes partial migration (*cf.* Goodall *et al.* 1951, Kusch & Marín 2010).

Kusch & Marín (2010) compiled natural history and distributional records of the species (45 records between 1881 and 2010) and proposed a breeding season from September to February in the area south of the Golfo de Penas (48–56°S), and a non-breeding season from March to August, spent mainly in coastal areas between 36°S (north of the province of Concepción) and 48°S (Guayaneco archipelago). However, the species' status between 46°S to 50°S, an area of 444 km that includes the Northern Patagonian Icefield (NPI) and the northern edge of the Southern Patagonian Icefield (SPI), is uncertain because of the region's relative inaccessibility and low observer presence. There is a single record in this region, by Trimble (1943) at Puerto Huemules (47°30'S, 73°42'W; near Ventisquero Steffen, NPI) on 11 March 1939, which was classified as part of the post-breeding area by Kusch & Marín (2010).

Here we report two new northern localities for the Fuegian Snipe during the breeding season and discuss the need to explore the southern NPI to clarify the distribution limits of the species.

Field work and Methods

Parque La Tapera is a privately protected area of c.12,425 ha, located between 48°07'S and 48°18'S in Aysén region, 50 km south of Caleta Tortel and adjacent to Ventisquero Jorge Montt (Fig. 1). The area comprises mainly evergreen forests and peatlands (Luebert & Plischoff 2017). The upper stratum of broadleaf evergreen forest is dominated by *Nothofagus betuloides*, generally associated with *Tepualia stipularis*, *Drimys winteri* and

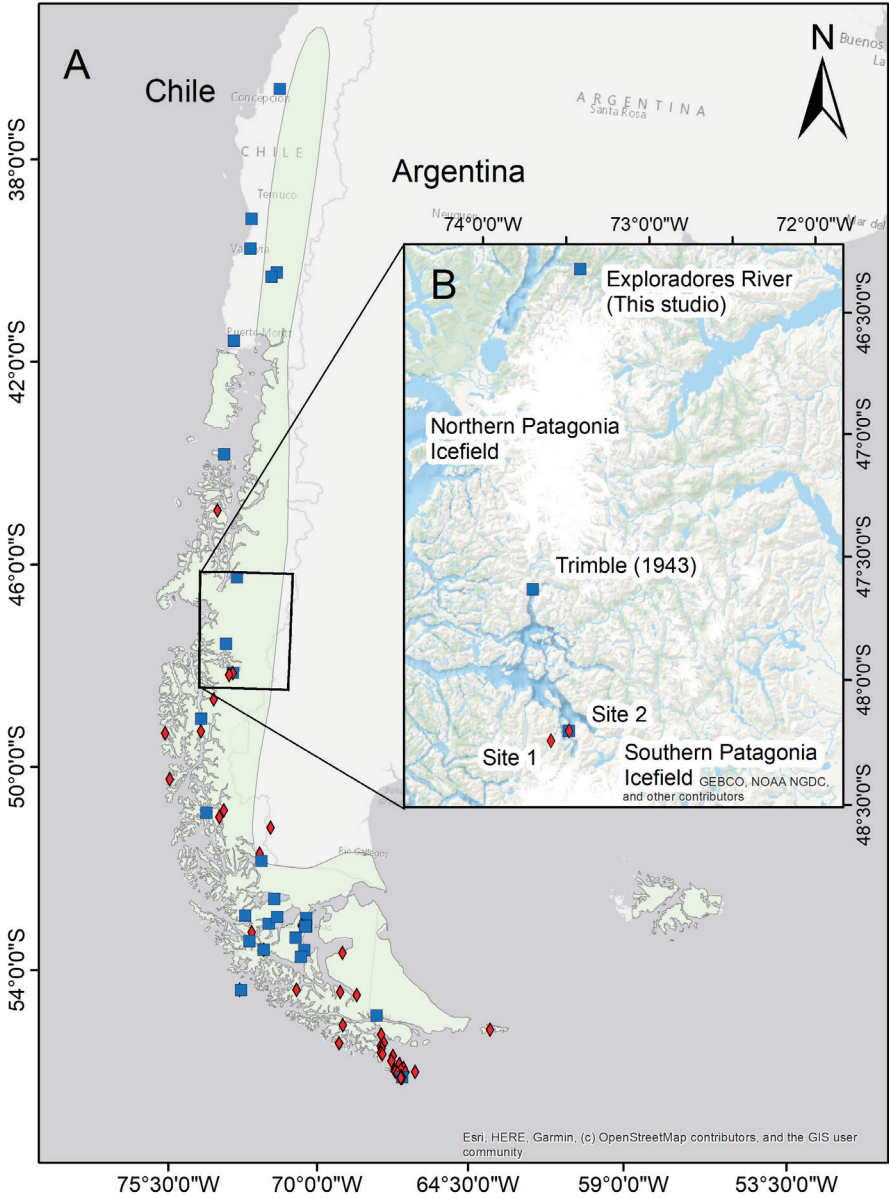


Figure 1. Distribution of Fuegian Snipe *Gallinago stricklandii* (olive) as proposed by IUCN overlain on (A) all localities mentioned for the species according to references in Kusch & Marín (2010; with various corrections based on original sources) and eBird (2022) with photo validation, and classified according to Kusch & Marín (2010) into non-breeding/migration (blue squares) and breeding (red diamonds). (B) Focus on records between 46° and 48°S, showing sites 1 and 2 in Parque La Tapera, and río Exploradores.

Raukaua laetevirens. In parts, *Pilgerodendron uviferum* dominates the tree layer. Other areas with poor drainage are covered by peatlands dominated by cushion plants (*Donatia fascicularis*, *Oreobolus obtusangulus* and *Astelia pumila*). In low, especially waterlogged areas, bogs are predominated by *Sphagnum magellanicum* and *Marsippospermum grandiflorum*.

Between 2016 and 2021 VR explored Parque La Tapera while conducting wildlife inventory surveys, during which he recorded Fuegian Snipe twice: once in summer 2017 (17 January; 48°14'S, 73°35'W) when an individual was seen at the edge of a stream (hereafter site 1) and secondly (48°12'S, 73°28'W) in late summer 2021 (23 March; interpreted as a winter record *sensu* Kusch & Marín 2010), when one was observed in a shrubby, boggy meadow (site 2). The records were c.10 km apart (Fig. 1b). In both cases the birds were seen for c.30 minutes, during which time chicks / juveniles were searched for, without success. A new expedition to the area, involving five researchers, was made on 5–8 December 2021 with the aim of evaluating the species' breeding status in the area, employing diurnal and nocturnal surveys, the latter to detect displays (Reynolds 1935). To increase the probability of detection, aerial display vocalisations were broadcast using a loudspeaker. The vocalisations used are available at <https://www.xeno-canto.org/XC730172> and were recorded at Isla Carlos III, Magallanes region, Chile. Efforts were focused on the sites of the previous records, especially site 1 as it was made during the breeding period. When searching open areas, the participants walked in a line to flush birds, advancing in parallel, and sometimes separated into two groups to cover more ground. Edges of watercourses were walked in zigzag lines to increase detectability.

Results and Discussion

On 5 December 2021, an adult was observed, mist-netted and banded at site 1, c.300 m from the 2017 sighting. At night, aerial displays of at least two individuals were heard between 22.30 h and 04.00 h south-west of the capture point. Next day, the search area was extended further south in areas of potentially suitable habitat, but without additional sightings. On 7 December 2021, the first area was revisited, and two adults were found together (less than 2 m apart) in the vegetation, and <100 m from the first capture. When they were trapped with mist-nets, it was found that they were the already banded bird and a second individual, possibly a pair given their proximity. Although they could not be sexed (absence of cloacal protuberance), when comparing plumage and size, one was observably darker and larger than the other (Table 1, Fig. 2e). A wrinkled and somewhat dry brood patch was visible in both individuals, indicative of a recently completed incubation period. These observations are consistent with records of adults seen with chicks on islands further south in November–December (Kusch & Marín 2010). During the afternoon and evening of 7 December we surveyed site 2, and at 22.44 h we heard a territorial display in response to playback, thus potentially confirming use of this area too during the breeding period. Next day we extended the search around site 2, but did not encounter more individuals. The aerial display sound consists of two interspersed modulated elements (XC690989) with a duration of three seconds, a min. frequency of 874 Hz and a max. 2,488 Hz (frequency peak 2,067 Hz; Fig. 3). Compared to Magellanic Snipe *G. magellanica* from Magallanes (*cf.* Miller *et al.* 2020), the recording of *G. stricklandii* lacks harmonics, and has two modulated elements, one of longer duration than the other (0.07 vs. 0.185 seconds).

In terms of habitat characteristics, site 1 corresponds to an azonal vegetation community of broadleaf evergreen forest, riparian forest dominated by the deciduous species *Nothofagus antarctica*, and shrubs such as *Ribes magellanicum*, *Escallonia alpina*, *Berberis microphylla* and *B. ilicifolia*. The herbaceous stratum is largely dominated by the exotic grass *Holcus lanatus*, a biological legacy of the area's cattle-raising past. Other abundant species

TABLE 1
Measurements and additional data from banded individuals of Fuegian Snipe *Gallinago stricklandii* at Parque La Tapera, Aysén region, Chile, in December 2021.

	Individual 1	Individual 2
Capture date	5 December 2021	6 December 2021
Mass (g)	220	240
Cloacal protuberance	0	0
Incubation patch	Dry and wrinkled	Dry and wrinkled
Wing (mm)	144	141
Tail (mm)	57	51
Bill length (mm)	72.5	76.7
Tarsus (mm)	37.9	38.1
Age	Adult	Adult
Sex	Indeterminate	Indeterminate



Figure 2. (a) Terrestrial and (b) aerial views of the vegetation at site 1 in Parque La Tapera, Aysén region, Chile; (c–d) vegetation at site 2; (e) two Fuegian Snipes *Gallinago stricklandii* trapped at site 1; and (f) Fuegian Snipe at the río Exploradores.

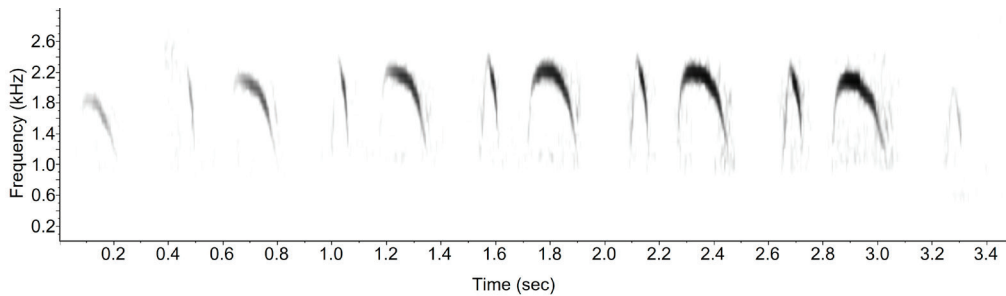


Figure 3. Sonogram of Fuegian Snipe *Gallinago stricklandii* aerial display recorded in Parque La Tapera, Aysén region, Chile; available at <https://www.xeno-canto.org/> (XC690989).

are *Marsippospermum grandiflorum* and the fern *Blechnum penna-marina*. On the other hand, site 2 corresponds to arborescent thicket dominated by *Nothofagus betuloides*, associated with *Drimys winteri* and *Pilgerodendron uviferum*. The most abundant shrubs are *Gaultheria mucronata*, *Berberis ilicifolia* and *B. microphylla*, and the herbaceous layer includes *Gunnera magellanica* and *Marsippospermum grandiflorum* (Fig. 2a–d). The ground is waterlogged year-round and freezes in winter. The habitat differs in composition and structure from areas further south where the species has been recorded using mainly sphagnum bogs (Schlatter 2004, Kusch & Marín 2010, Schmitt 2017), and to a lesser extent evergreen forest, meadows and swamps (Kusch & Marín 2010). On Isla Carlos III (53°39'S, 72°16'W), where the species has been recorded in both summer and winter, records are from pulvinus bogs and *Sphagnum* mosses protected by coastal forest (S. Saiter pers. comm.) Although searches of continental peatlands in the Aysén region are few, recent efforts have been unsuccessful (Raimilla 2021), supporting the hypothesis that at these latitudes the species would use fjord areas (Kusch & Marín 2010), at least in summer.

There is also a record on 28 March 2022, 209 km north of La Tapera and 148 km north of Trimble's (1943) record. A Fuegian Snipe was photographed by DT (Fig. 2f) at dusk in the delta of the río Exploradores (46°19'S, 73°24'W), at the southern edge of the NPI, with displays heard by DT in December and January. *Sensu* Kusch & Marín (2010), this would be classed as a winter record, however display suggests the bird was defending a breeding territory. A similar situation could apply to Trimble's (1943) record 148 km north of our records and on a similar date (11 March), as well as that in Parque La Tapera on 23 March 2021 (see above) and another in Archipiélago Almirantazgo on 3 March 2020 (Arredondo *et al.* 2022), suggesting a greater permanence in the breeding area than previously supposed (February; Kusch & Marín 2010).

Our records of presence and displays of Fuegian Snipe during the breeding season in Parque La Tapera during three reproductive periods (2017–18, 2020–21 and 2021–22) and Bahía Exploradores in 2022, suggest that the species' breeding range extends north of 48°S, *contra* Kusch & Marín (2010), to at least 46°S. Indeed, there are historical records north of 46°S during the breeding period or very close to its end: Archipiélago De Los Chonos, Aysén (45°S, 74°W; Hellmayr 1932) in January 1858 (361 km north of our records), Puerto Huemules (47°38'S, 73°42'W; Trimble 1943), near the Steffen Glacier, on 11 March 1939 (68 km north of our records) and the recent record at the río Exploradores (this study). These suggest that the northern boundary of the breeding range extends to 45°S. Although migratory movements are still unresolved and the species' wintering areas are unclear, as evidenced in Fig. 1, the presence of apparently resident populations in the south of its range, e.g., on Isla Carlos III (S. Saiter pers. comm.), suggest that the geographical classification of Kusch & Marín (2010) may not be appropriate.

Finally, use of playback was a key tool in confirming the species' presence and we strongly encourage its use in future surveys. For this possible new breeding population there are currently few evident threats, although predation by the introduced American Mink *Neovison vison* (Schmitt 2017) is an expanding and worrying one. Additional threats are still unknown, as are those it may face in its still imprecisely known wintering range.

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