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Bats on the edge: updated records in Cape Horn archipelago, Chile

XENABETH LÁZARO[1*], GONZALO OSSA[2], BRUCE MILLER[3]

[1] https://orcid.org/0000-0003-2660-6150
[2] https://orcid.org/0000-0001-6823-1671
[3] https://orcid.org/0000-0001-5719-1942

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Dr. Rodrigo Villa-Martínez Universidad de Magallanes, Centro Internacional Cabo de Hornos (CHIC), Chile.
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MSc. Marcela Valenzuela Saavedra, Centro Internacional Cabo de Hornos (CHIC), Chile.

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ABSTRACT

Chilean Patagonia hosts the southernmost bats on the planet, *Myotis chiloensis* and *Histiotus magellanicus*. The records from the Cape Horn archipelago date back nearly 75 years ago and are observational, lacking verification and therefore of questionable reliability. Additionally, information on bats in these high-latitude ecosystems of South America is scarce. This study aimed to follow up on previous observations and confirm the presence of bats in the Cape Horn National Park (55° S, 67° W) using a combination of acoustics and capture methods. Acoustic recorders were placed at 12 locations across Wollaston, Hermite, and Herschel islands from November 10 to 16, 2022, and activity was detected at seven of these locations. Mist nets were set up on Hermite Island for one night, and five individuals were captured. Relative abundance of bats on the islands was estimated using the acoustic activity index (AI). The bats recorded and captured were identified as *H. magellanicus*, and no individuals of *M. chiloensis* were detected. Our results support the presence of *H. magellanicus*, providing insight into the species' southerly range limits. However, a more extensive survey is needed to confirm the absence of *M. chiloensis* in the Cape Horn archipelago. Future studies should investigate these bat species' ecology and life history, including their habitat preferences, physiological adaptations, diet, and behavior at this latitude.

Keywords: subantarctic, *Histiotus*, bioacoustics, biosphere reserve, bats

Murciélagos en el límite: actualización de registros en el archipiélago de Cabo de Hornos, Chile.

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RESUMEN

La Patagonia chilena alberga los murciélagos más australes del planeta, *Myotis chiloensis* e *Histiotus magellanicus*. Los registros del Archipiélago de Cabo de Hornos ocurrieron hace casi 75 años y son observacionales sin verificación alguna, por lo que su fiabilidad resulta cuestionable. Además, la información sobre murciélagos en estos ecosistemas de alta latitud en Sudamérica es escasa. Este estudio tuvo como objetivo dar seguimiento a observaciones previas y confirmar la presencia de murciélagos en el Parque Nacional Cabo de Hornos (55° S, 67° W) utilizando una combinación de métodos de acústica y captura. Se colocaron grabadoras acústicas en 12 ubicaciones en las islas Wollaston, Hermite y Herschel del 10 al 16 de noviembre de 2022, y actividad de murciélagos fue detectada en siete de estas ubicaciones. Se colocaron redes de niebla durante una noche en Isla Hermite, donde se capturaron cinco individuos. La abundancia relativa de murciélagos en las islas se estimó utilizando el índice de actividad acústica (IA). Los murciélagos registrados y capturados fueron identificados como *H. magellanicus*, y no se detectaron individuos de *M. chiloensis*. Nuestros resultados apoyan la presencia de *H. magellanicus* aportando una comprensión sobre el límite austral del rango de dicha especie. Sin embargo, un monitoreo más extensivo es necesario para confirmar la ausencia de *M. chiloensis* en el archipiélago de Cabo de Hornos. Se sugiere que futuros estudios investiguen la ecología e historia de vida de estas especies, incluyendo sus preferencias de hábitat, adaptaciones fisiológicas, dieta y comportamiento en estas latitudes.

Palabras clave: subantárctico, *Histiotus*, bioacústicas, reserva de la biósfera, murciélagos

INTRODUCTION

Bats are geographically widespread, with the greatest diversity occurring in the tropics and only a few species reaching extreme latitudes. For example, in the northern hemisphere, the northern bat (*Cnephaeus nilssoni* [von Keyserling & Blasius, 1839]) is the northernmost bat species in the world and is exceptionally adapted to cold climates, with its distribution extending above the Arctic Circle (Cláudio *et al.* 2023; Kotila *et al.* 2023; Siivonen & Wermundsen, 2008). In the southern hemisphere, sub-Antarctic ecosystems also have a low diversity of bat species, as special adaptations are required to cope with the high energy demands caused by the extreme climatic conditions in the region (Jaksic & Martínez, 2023). In the southernmost part of Patagonia, only three species are known: *Myotis chiloensis* (Waterhouse, 1840), *Histiotus magellanicus* (Philippi, 1866), and *Lasiurus varius* (Poeppig, 1835) (Dabbene, 1902; D'Elía *et al.* 2020; Osgood, 1943). The southernmost record for *L. varius* is from Ushuaia, Tierra del Fuego (Dabbene, 1902), although this seems to have been an isolated record which has not been followed up on in recent years (Dabbene, 1902; Ossa *et al.* 2019; Tamayo & Perez, 1979). The other two, *H. magellanicus* and *M. chiloensis,* are the species with the southernmost known records in the world, and occur on the islands of the Cape Horn archipelago (Barquez *et al.* 1999, 2013; Jaksic & Martínez, 2023; Olrog, 1950).

Olrog (1950) reported observing flying bats he attributed to the species *M. chiloensis* and *H. magellanicus* (the latter of which he referred to as *Eptesicus montanus magellanicus*) on Wollaston and Grevy islands in the Cape Horn archipelago. However, as no captures were performed, their identity was assumed to be the same as noted by Dabbene (1902) and Osgood (1943), the most current publications on the bats of Tierra del Fuego. However, those records were approximately 100 km farther north with different ecological and environmental conditions. Current understanding of the range limits of *H. magellanicus* is mixed. Some sources cite Olrog (1950), stating that it extends to the Cape Horn archipelago (Díaz *et al.* 2019), while others cite Peña & Barria (1972), stating that it extends only until Navarino Island (IUCN, 2016a; Map of Life, 2023a; Rodríguez-San Pedro *et al.* 2015, 2016). That of *M. chiloensis* is that it extends only as far south as Navarino Island (Barquez *et al.* 2013; IUCN, 2016b; Map of Life, 2023b; Ossa & Rodríguez-San Pedro, 2015; Rodríguez-San Pedro *et al.* 2016). This inconsistency is likely due to the lack of verifiable evidence in Olrog's (1950) observations.

The literature for southern Chilean Patagonia mainly consists of species distribution records based on observations. This is especially true for the islands south of the Strait of Magellan (e.g., Navarino Island and Wollaston Island), whose only records were between 53 and 75 years ago (Koopman, 1967; Olrog, 1950; Peña & Barria, 1972). To date, there have been no studies focusing on bats and incorporating new methodologies, such as acoustics, in the region. The use of acoustic sampling allows for the passive collection of information on the species present in an area. It is well known that combining acoustic monitoring with traditional capture methods, such as mist nets or harp traps, improves the detection of species, especially aerial insectivores that generally avoid capture (MacSwiney *et al.* 2008; Silva & Bernard, 2017; Wordley *et al.* 2018). In many cases, acoustic records provide new distributional records for species that generally avoid capture (Miller *et al.* 2024; Ochoa *et al.* 2025; Trujillo *et al.* 2025).

As it has been 75 years since the last observations were made, we conducted a study in the Cape Horn archipelago, now known as Cape Horn National Park, in southern Chile, using modern technology and commonly used sampling techniques for bat monitoring (Fernández *et al.* 2016). Given that only three potential species (*M. chiloensis, H. magellanicus,* and *L. varius*) are known to have southern distributions, this study focused on determining their occurrence in the world's southernmost forests using acoustic monitoring and mist net captures as monitoring methods.

MATERIALS AND METHODS

Study area

Cape Horn National Park (CHNP) (55° S, 67° W) (Fig. 1) is the southernmost archipelago of the subantarctic ecoregion of Magallanes and contains the southernmost forests on the planet (Rozzi *et al.* 2007), located just 1,000 km from the Antarctic Peninsula. The vegetation of the Cape Horn archipelago belongs to the Magellanic Tundra Complex (Gajardo, 1994) and includes evergreen forests, peatland communities, and hyper-humid Andean Desert communities (Pisano, 1980). This area has also been classified as Magellanic subpolar forests (Olson *et al.* 2001). There is low vegetation and flora diversity due to the extreme climatic factors, such as the altitudinal decrease in temperatures and exposure to strong winds. Nevertheless, the species occurring there are incredibly well-adapted to these extreme conditions. The forests of the Cape Horn archipelago are found along the coasts, ravines, lagoons, valleys, and hills. They consist of trees such as Magellan's beech (*Nothofagus betuloides* (Mirb.) Oerst), winter's bark (*Drimys winteri*), and occasionally a dwarf variety of Magellan's or hard log mayten (*Maytenus magellanica* Hook.

F. 1845), as well as shrubs like prickly heath (*Gaultheria mucronata* (L.f.) Hook. & Arn.), holly barberry (*Berberis ilicifolia* L. f.), and red crowberry (*Empetrum rubrum* Vahl ex Willd.) (Pisano, 1980; Lázaro, personal observation, November 2022). Our study area comprised of three islands within the archipelago: Wollaston, Herschel, and Hermite.

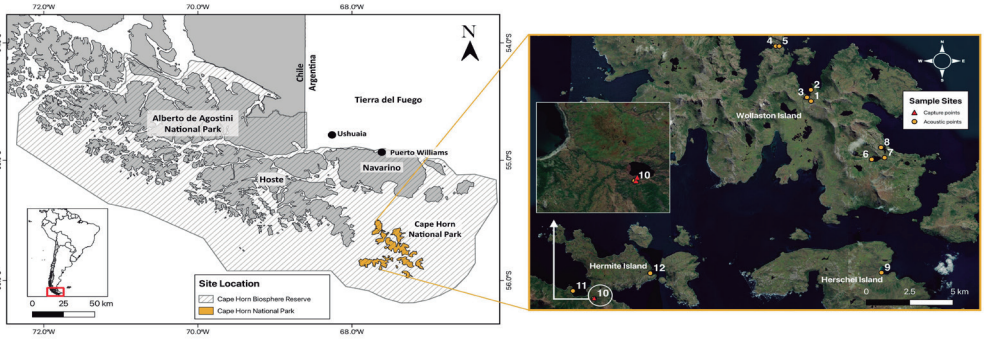

Fig. 1. Location of Cape Horn National Park (55° S, 67° W) within the Cape Horn Biosphere Reserve, Chile and map of the study area. Acoustic (yellow circles) and capture (red triangles) sites in Cape Horn National Park; Wollaston Island, Hermite Island, and Herschel Island. Sites are numbered in the order they were visited. Note: the capture point in Hermite Island overlaps with an acoustic point (10), as both monitoring methods were performed at the same site.

Acoustic monitoring

Bat monitoring was conducted on the Wollaston, Herschel, and Hermite islands of CHNP between November 10 and 16, 2022. We deployed ultrasound detectors (one Song Meter SM2+ and two Song Meter SM4FS, Wildlife Acoustics Inc., Massachusetts, USA) at 12 sites (Fig. 1). All detectors were set to a sample rate per second of 256 kHz to record calls up to 128 kHz. Units were auto-triggered to record with a minimum triggering frequency of 8 kHz. The detectors were active for one night at each location, set to record from sunset to sunrise (approximately 8.5 hrs.), and were positioned at least 200 m apart. The sampling sites were selected based on current knowledge of Patagonian bat habitats and site accessibility (Altamirano *et al.* 2017; Díaz *et al.* 2019; Ossa *et al.* 2020; Ossa & Rodríguez-San Pedro, 2015). Sites were only accessible by boat, with access dependent on dynamic weather conditions for the timing of disembarking and safety. The sampling sites represented the predominant habitat types in the area, including forests, lakes, and shrublands (Pisano, 1980). A detector was also placed near mist nets during one night of captures to record reference calls from released individuals. These reference calls were later used to aid acoustic identification, and the recordings were included in the analysis along with data from the other acoustic monitoring points. This detector was redeployed to a new sampling site the following morning.

Captures

A night of capture was conducted on Hermite Island on November 14, 2022, using two 14 mm mesh monofilament mist nets (6 m and 12 m long, Ecotone, Poland). The mist nets were open from 21:00 hrs. to 00:00 hrs., starting 30 minutes before sunset and closing when the ambient temperature dropped below 10 °C and activity waned (Ossa *et al.* 2020). The mist nets were checked every 10 minutes to minimize stressing captured individuals. Prior to release, captured bats were identified to species, measured, and photographed. In-hand species identification was based on: Díaz *et al.* (2021) and Galaz Leigh *et al.* (2021). Animals were handled in compliance with the live animal handling protocols suggested by Sikes *et al.* (2016). The capture and handling of bats was carried out under the capture permits issued by the Agricultural and Livestock Service (SAG) (Exempt Resolution No: 6510/2022) and by the National Forest Corporation (CONAF) (Exempt Resolution No: 531/2022).

Data analysis

All recordings were stored in compact flash cards as WAV files for subsequent analysis and identification. WAV files were preliminarily screened for bat calls and filtered for acoustic noise such as wind or other sources using Kaleidoscope Pro (V5.6.8, Wildlife Acoustics). All WAV files were converted to zero-crossing (ZC) format using AnalookW (ver. 4.7.t) (Corben, 2022). Although noise filtering is generally effective at identifying files without bat calls, all files classified as noise by Kaleidoscope Pro were manually reviewed in case any isolated identifiable pulses were missed in files with significant noise, resulting in a false negative (Solick *et al.* 2024).

Two hundred and forty-four files with 7,133 identifiable bat calls were compared to verified voucher call files of the three potential species recorded by Ossa (unpublished data) and published parameters (*e.g.* Díaz *et al.* 2019; Miller *et al.* 2021; Rodríguez-San Pedro *et al.* 2016; Rodríguez-San Pedro & Simonetti, 2013). Only sequences with more than two pulses were used to extract call parameters. Diagnostic call shapes and acoustic parameters were analyzed using AnalookW [ver. 4.7.t] (Corben, 2022). The characteristic frequency of the dominant harmonic (Fc) was the main parameter used for identification, as it is the most robust characteristic and readily measured. It is important to note that, in some publications, the Fc and the frequency with the maximum energy (FME), or peak frequency (Fp), are often used interchangeably. However, these parameters are not identical and may differ considerably, meaning they are not directly comparable. We also used the characteristic slope (Sc) measured as octaves per second, or the slope of the body of the call, as it is another key feature for call identification, used to separate species with similar Fc values (Miller & Corben, 2022). Other call frequency parameters measured in kilohertz (kHz) were minimum frequency (Fmin), maximum frequency (Fmax), average frequency (Fmean), and frequency of the knee (Fk, a point where a dramatic change of slope occurs), in addition to the following time parameters measured in milliseconds (ms): duration of each pulse (Dur) and the inter-pulse interval or time between calls (TBC). We also include four derived values: the Fc of both the fundamental (FcH1) and third harmonic (FcH3), the proportion of maximum frequency to the characteristic frequency (PMC), and the bandwidth (Bw, Fmax-Fmin).

The relative abundance of bats on the islands was estimated using the standardized acoustic activity index (AI), which quantifies the presence of bats within one-minute intervals (Miller, 2001). The AI, or sum of minutes where bats are present, was adjusted to account for a survey duration of 8.5 hours and standardized to 10 survey hours for comparison between the sampling sites. For comparison between islands, relative abundance was calculated as the mean standardized AI across all sampling sites on each island.

RESULTS

Acoustic data

Of the 12 sites, recorders at two sites on Wollaston Island (2, 5) malfunctioned, resulting in only 10 sites with acoustic data. It is not unusual to record ambient noise, such as wind, under some environmental conditions. Such files may also include identifiable bat calls, as was the case with our data. After manual review of all files, three sites on Wollaston Island (1, 4, 7) recorded no bats; only ambient noise. A total of 405 WAV files were recorded from 10 sites. After converting to ZC format for analysis and manual review, 244 files with bat calls remained. Bat activity was recorded at seven sites, but finally six sites remained with identifiable calls (i.e., more than 2 pulses).

Table 1. Summary of verified call pulses of *H. magellanicus* recorded in Cape Horn National Park used for comparison with voucher files: Dur – duration (ms), TBC – time between calls, Fmin – minimum frequency (kHz), Fmax – maximum frequency, Bw - bandwidth, Fmean – average frequency, Fk – frequency of the knee, FcH1 – characteristic frequency of the fundamental harmonic, Fc – characteristic frequency, FcH3 – characteristic frequency of the third harmonic, Sc – characteristic slope (octaves/s), PMC – proportion of maximum frequency to the characteristic frequency. The frequency values are provided as a guide; 90% of the pulses fall within this range, with 10%-75% indicating variability. Diagnostic values were rounded to the nearest whole number.

Parameters	N	Min	Max	Mean	St. Dev	10%	25%	75%	90%
Dur	7133	1	5	2.3	0.8	1	2	3	4
TBC	7133	1	3770	84.4	118.3	31	57	86	123
Fmin	7133	40	62	46.9	3.1	43	45	49	51
Fmax	7133	44	110	72.7	13.8	57	63	77	95
BW	7133	3	68	25.7	14.1	10	15	31	49
Fmean	7133	42	76	56.0	4.6	50	53	59	62
Fk	7133	42	78	54.2	4.6	49	51	57	61
FcH1	7133	22	35	25.8	2.1	24	24	27	29
Fc	7133	43	70	51.6	4.1	48	49	54	57
FcH3	7133	65	104	77.4	6.2	71	73	81	86
Sc	7133	-594	778	161.9	109.3	42	98	219	287
PMC	7133	0	137	41.1	26.9	13	20	54	86

The range of the Fc values from all of the obtained calls (N = 7,133) were lower than that of *M. chiloensis* (Fig. 2a), and the Sc values and visual shapes did not match those of *L. varius* (Fig. 2c) (Ossa & Rodríguez-San Pedro, 2015; Rodríguez-San Pedro & Simonetti, 2014). Therefore, no calls were consistent with diagnostic call parameters of either *L. varius* or *M. chiloensis* (see Table 1 to compare values to Fig. 2a, b & c). All verified calls recorded on Wollaston, Herschel, and Hermite islands were those of *H. magellanicus*. *H. magellanicus* calls are typical broadband vespertilionid calls and characterized by a rapid string of short-duration frequency-modulated pulses that rapidly decrease in frequency and may terminate with a slight upward tick in frequency, as noted by others (Fig. 3) (Díaz *et al.* 2019; Miller *et al.* 2021). Based on the verified call data, relative abundance was highest at site 10 on Hermite Island (standardized AI = 81.2), whereas site 3 on Wollaston Island had the lowest (standardized AI = 1.2). Of the islands, Hermite had the highest activity (42.8), followed by Wollaston (35.9) and Herschel (3.5).

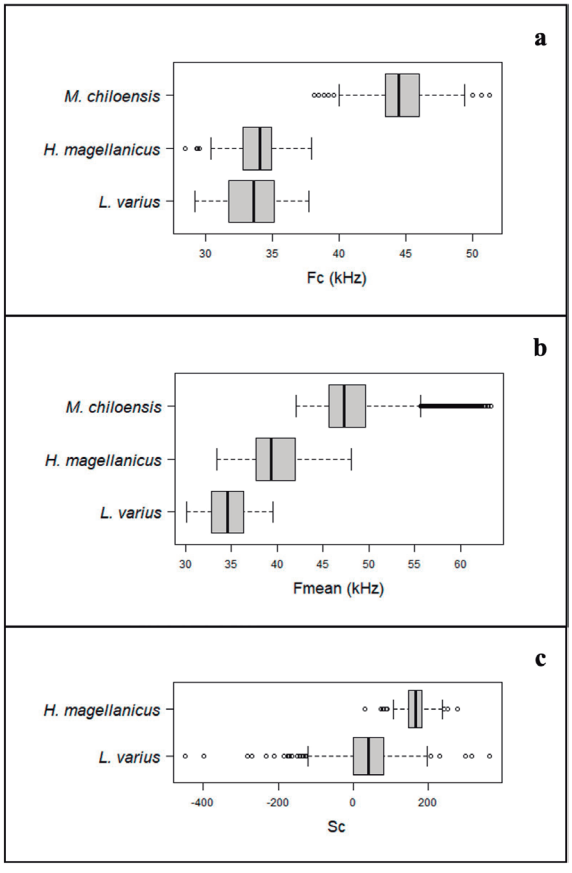

Fig. 2. Fc (characteristic frequency) and Fmean (average frequency) values in kHz of the three potential species, and Sc (characteristic slope; octaves/s) values of *H. magellanicus* and *L. varius*. Box-plots show a) the overlap of 50% and median values with outliers for the Fc of *H. magellanicus* and *L. varius*, b) the separation of the Fmean for all three species, and c) the separation of the Sc of the two species that have overlapping Fc values from box-plot a. Values are of verified species calls from other regions of Chile provided by the authors, G. Ossa and B. Miller.

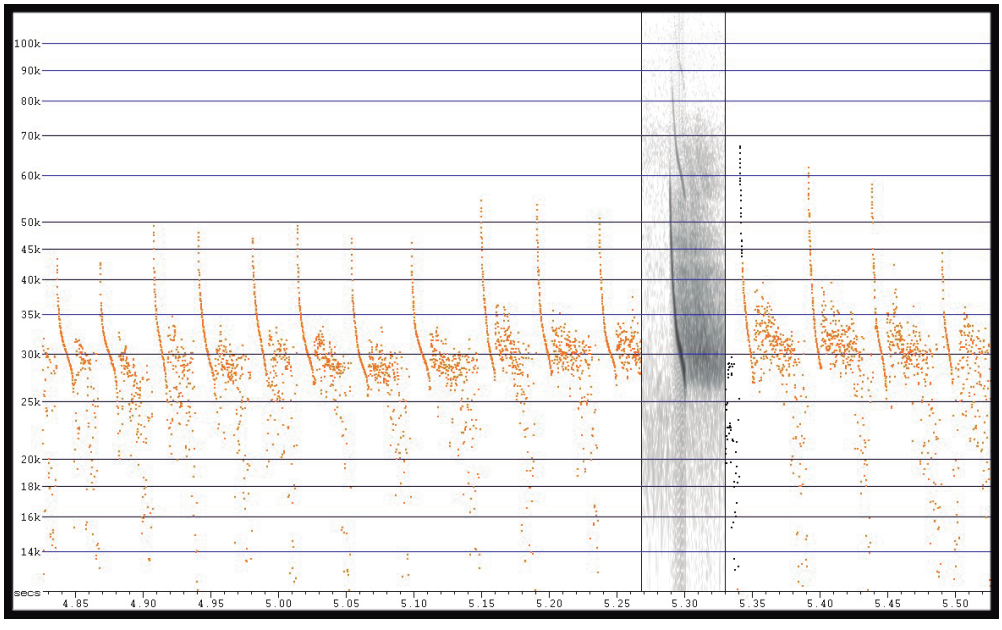

Fig. 3. Example of broadband call pulses of *H. magellanicus* recorded during the study from Hermite Island. Most pulses show following diffuse echoes from the surrounding environment. The display shows calls in ZC format using compressed view, removing time spaces without call pulses to visualize the complete call sequence using AnalookW, and one pulse in full spectrum which shows the multiple harmonics.

Morphological observations

Five individuals were captured, three adult females and two adult males of *H. magellanicus,* on the edge of a mixed forest and a small lake. All matched the description by Díaz *et al.* (2021) and Galaz *et al.* (2021), with dark brown-yellow coloration on the front and back and a clear separation of the ears (Fig. 4). Standard external measurements were: forearm length of 43-45 mm, tail length of 35-43 mm (from the base to the tip of the tail), body length of 57.5-63.5 mm, and total length (sum of tail and body) of 98-100.5 mm (Table 2). Body length was measured from the crown of the head, instead of from the tip of the snout, to the base of the tail; values are therefore expected to underestimate standard body length by approximately 3–4 mm.



Fig. 4. Female *H. magellanicus* captured on Hermite Island, Cape Horn National Park, a) shows the dark brown-yellow ventral coloration, b) shows the dark dorsal coloration and the distinctive separation of ears characteristic of the species. Photo: Javier Nicolás Estay Vergara.

Table 2. Mean and standard deviation of the morphometric measurements for *H. magellanicus* individuals captured in Cape Horn National Park. Measurements are in millimeters and rounded to one decimal place.

	Mean ± SD			
Sex	**Forearm**	**Tail**	**Body**	**Total length**
Female (n=3)	45 ± 0	38 ± 3	61.2 ± 2.3	99.2 ± 0.8
Male (n=2)	43.5 ± 0.7	41.5 ± 2.1	57.8 ± 0.4	99.3 ± 1.8

DISCUSSION

The results of this study confirm the presence of *H. magellanicus* in the Cape Horn archipelago, the southernmost limit of its range (Fig. 5). Our data supports Olrog's observation of *H. magellanicus* presence, but contrary to his report, we did not confirm any records of *M. chiloensis*.

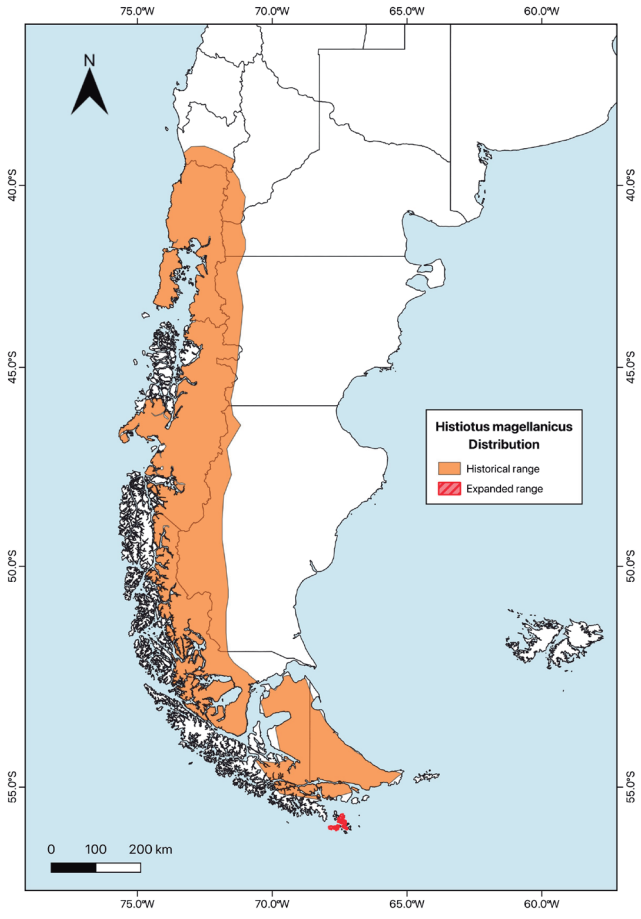

Fig. 5. Distribution of *H. magellanicus* (orange) as recognized by the International Union for Conservation of Nature (IUCN) (2016a) and the new verified record (red).

The calls recorded during this study were quantitatively compared with voucher recordings of other species that could potentially be found in the area, such as *M. chiloensis* and *L. varius*. The calls in our acoustic data did not include call pulses consistent with the low-frequency recordings of *Lasiurus*, as this species produces calls of longer duration, with a quasi-constant frequency portion that is not observed in our data (Barclay, 1986). The vocal signature of the other potential species, *M. chiloensis,* has an Fc at higher frequencies, generally above 43 kHz, also not found in our data (Ossa *et al.* 2010; Ossa & Rodríguez-San Pedro, 2015). Several previously published acoustic parameters (e.g., Giménez *et al.* (2023)), which include *H. magellanicus*, have limited taxonomic use. Parameters such as start and end frequencies provide little information for species identification. Similarly, the Fmax (referred to as HF) is strongly influenced by the distance of the bat from the microphone when recorded. Higher frequencies attenuate more rapidly with increased distance; therefore these parameters can vary due to recording conditions rather than reflect species-specific call structure.

The morphological measurements and identification of captured bats further confirmed the acoustic identification. While the Fc values and some external measurement values were at the lower range of what has been recorded for *H. magellanicus* in other parts of its range in Chile and Argentina (Giménez *et al.* 2023), they were still constant with the species, further corroborated by the forearm measurement, which was consistent with values used for species

identification (Barquez *et al.* 1999; Díaz *et al.* 2019; Giménez *et al.* 2012; Osgood, 1943; Peña & Barria, 1972; Rodríguez-San Pedro *et al.* 2015, 2016).

Olrog (1950) reported observing *H. magellanicus* and *M. chiloensis* in flight and supported the identification of these individuals by referencing Osgood (1943) and Dabbene (1902), which were the closest geographical records for species that might inhabit the Cape Horn archipelago. However, he did not obtain an individual to confirm the identity. Considering that the information described by Osgood and Dabbene pertains to bats found as far south as Ushuaia and the surrounding areas in Tierra del Fuego, Argentina (54° S, 68° W), these references may not accurately represent the species that may occur further south in the Cape Horn archipelago, or the environmental conditions present there.

These are the last forests in the southern hemisphere before reaching Antarctica that are inhabited by bats, which shows that *H. magellanicus* is capable of surviving and inhabiting areas with suboptimal conditions. *H. magellanicus* and *M. chiloensis* typically co-occur in the same habitat, and thus it is surprising that we did not encounter *M. chiloensis* in our study area (Canals *et al.* 2005; Díaz *et al.* 2019; Ossa & Rodríguez-San Pedro, 2015). It is possible that the distribution of *M. chiloensis* is currently limited to Navarino Island and Hoste Island (the nearest locations where *M. chiloensis* has been found) (Koopman, 1967; Lázaro, personal observation, December 2021; Lázaro, 2025; Ossa & Rodríguez-San Pedro, 2015; Peña & Barria, 1972). However, we suggest that additional acoustic sampling be carried out on the archipelago's other islands (e.g., Grevy Island and Hornos Island) to determine this species' southern range limit.

There are some limitations in the data collection that must be acknowledged. The climatic conditions of our study area and the available locations for safe disembarkation limited the scope of our sampling effort to one week of acoustic sampling and one night of captures in the late spring-early summer. Wintering behavior in these species remains unstudied; some *Myotis* species in the northern hemisphere hibernate or migrate at high latitudes (Fleming, 2019). Notably, acoustic surveys conducted ~200 km north of this study at Karukinka Natural Reserve, Tierra del Fuego (54° S, 68° W), for four nights in November of 2016, recorded *M. chiloensis*, *L. varius*, and *H. magellanicus* (Ossa, unpublished data). It is possible that *M. chiloensis* was not active in November at the latitude of our study area, which could explain why we did not detect it during our sampling. However, another acoustics survey conducted in Navarino Island in 2022 detected *M. chiloensis* as early as August (Lázaro, unpublished data). This indicates that *M. chiloensis* is a resident species in this area and is expected to be present in November. Future studies could benefit from a longer survey period spanning multiple seasons, incorporating mist netting and acoustic sampling to confirm the presence or absence of *M. chiloensis* in the CHNP. Furthermore, feeding activity of *M. chiloensis* is known to begin at dusk and continue for about 3 hours before bats return to their roots (Ossa & Rodríguez-San Pedro, 2015). If bats were present and foraging in the area during the survey period, this species would have likely been detected.

We offer some conjecture regarding the possible absence of *M. chiloensis* in the CHNP: The high energy cost, low flight speed, and limited ability to regulate body temperature of this species—due to its small size and low wing loading—restrict its capactity to travel the distance between islands closer to mainland Chile and Argentina (e.g., Navarino Island and Hoste Island) and the Cape Horn archipelago, which is approximately 45 km away (Canals *et al.* 2005; Iriarte-Díaz *et al.* 2002; Ossa *et al.* 2020; Ossa & Rodríguez-San Pedro, 2015). Additionally, the climatic conditions in this region further challenge its endurance. The composition of the vegetation in the Cape Horn archipelago is also different from that of Navarino and the surrounding islands

and may not be preferred by *M. chiloensis*. It may be that *M. chiloensis* prefers tall and large-diameter trees to inhabit, possibly lenga beech (*Nothofagus pumilio* Poepp. & Endl. Krasser) (Ossa *et al.* 2020), which only exists in a stunted form in the Cape Horn archipelago, limiting roosting options for this species. The forest patches in the Cape Horn archipelago are very small and exposed to the extreme winds of the area, which does not provide a good refuge for this species that inhabits and navigates within dense forests (Ossa & Rodríguez-San Pedro, 2015). Finally, as aerial insectivores that feed primarily on Dipterans (Ossa & Rodríguez-San Pedro, 2015), this species may not have sufficient insect resources in this extreme climate to sustain them (Gañan *et al.* 2021).

The presence of *H. magellanicus* in the CHNP is also interesting based on current knowledge of its ecology. Altamirano *et al.* (2017) and Ossa *et al.* (2020) indicate that *H. magellanicus* prefers to live in cavities and under the bark of lenga beech trees (*N. pumilio*) and other species of the *Nothofagus* genus. Peña & Barria (1972) also have records of specimens found under the bark of a *Nothofagus* sp. As previously mentioned, the forests that dominate the Cape Horn archipelago are composed of Magellan's beech (*N. betuloides*), and the lenga beech specimens found there are stunted, not exceeding 20 centimeters in height. Additionally, the Magellan's beech specimens present are too small in diameter to have cavities (Lázaro, personal observation, November 2022). Therefore, the habitat preferences and adaptations of *H. magellanicus* to this unique ecosystem differ from that of the rest of its range and warrant further investigation to better understand its ecology at the southern limit of its distribution.

This study is the first conducted in the area using acoustic sampling to investigate the diversity of bat species. Although our results support the current knowledge of the distribution of bats in Chile and South America, there is still much to learn about the ecology and behavior of these species at the southern extreme of their distribution (Jaksic & Martínez, 2023). Future studies should further investigate how sub-Antarctic bats withstand low temperatures and extreme climatic conditions, their roosting preferences, their diet under limited-resource conditions, and their winter behavior at extreme latitudes. This information is essential to better assess the vulnerability and conservation status of these species (Fernández *et al.* 2016).

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Supplementary Table. A summary of the relative abundance (activity) of *H. magellanicus* was sorted from highest to lowest value for each sample site based on our acoustic data. Relative abundance is the acoustic activity index (AI), or the sum of one-minute intervals where bats are present, adjusted by survey time and standardized to 10 survey hours.

Site	Location	Std. AI
10	Hermite Island	81.2
6	Wollaston Island	70.6
11	Hermite Island	36.5
12	Hermite Island	10.6
9	Herschel Island	3.5
3	Wollaston Island	1.2

Número afiliación	Nombre de la institución y/u organización
1	BatLab Finland, Finnish Museum of Natural History, University of Helsinki, Helsinki, Finland. * Corresponding autor: xena.a.lazaro3867@gmail.com
2	ConserBat EIRL, San Fabián, Chile; Asociación Murciélagos de Chile Pinüike, Valparaíso, Chile.
3	Neotropical bat acoustic assessments, Canadian Lakes, United States of America.

Autor	Afiliación
Xenabeth Lázaro	1
Gonzalo Ossa	2
Bruce Miller	3