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SHORT COMMUNICATION

New northern distribution limit of *Otaria byronia*: Salango Island, Ecuador

Nuevo límite norte de distribución para *Otaria byronia*: isla Salango, Ecuador

Lautaro Oyarzún-Galaz^{1,*} , Cristina Castro² , Jorge Acevedo¹ , Anelio Aguayo-Lobo³ , and Eliana Paola Acuña-Gómez¹ 

¹ Centro de Estudios del Cuaternario de Fuego-Patagonia y Antártica (CEQUA), avenida El Bosque 0296, Punta Arenas, Chile.

² Pacific Whale Foundation, malecón Julio Izurieta y Abdón Calderón, Puerto López, Ecuador.

³ Instituto Antártico Chileno (INACH), plaza Benjamín Muñoz Gamero 1055, Punta Arenas, Chile.

* Corresponding author: lautaro.oyarzun@cequa.cl

Abstract

A small haul-out site of South American sea lions (*Otaria byronia*) located on Salango Island (01°35' S, 80°52' W), Ecuador, is reported. During five visits conducted over six days between August and September 2023, between 14 and 109 males of different age classes were observed. Additionally, photographic records of *O. byronia* contributed by the Pacific Whale Foundation database along the coast of Salango Island between 2003 and 2024 were compiled, revealing that the presence of *O. byronia* at this site has increased notably since 2019, with the highest annual mean (14 ± 4.83 individuals) recorded in 2023. This site represents the northernmost known haul-out site, extending the distribution approximately 69 km further north than the previously known range at Punta Brava, Ecuador. The location of this haul-out site within a protected area may facilitate controlled access and repeated observations, providing a valuable opportunity for long-term monitoring of the species and improving our understanding of its distribution dynamics at the northern edge of its Pacific range.

Keywords: haul-out, Manabi Province, Otariidae, South American sea lion.

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Resumen

Se informa del registro de un pequeño apostadero de lobos marinos sudamericanos (*Otaria byronia*) ubicado en isla Salango (01°35' S, 80°52' W), Ecuador. Durante cinco prospecciones realizadas a lo largo de seis días entre agosto y septiembre de 2023, se contabilizaron entre 14 y 109 machos de distintas clases etarias. Adicionalmente, se recopilieron registros fotográficos de *O. byronia* aportados por la base de datos de Pacific Whale Foundation a lo largo de la costa de isla Salango entre 2003 y 2024, lo que revela que la presencia de la especie en este sitio ha aumentado notablemente desde 2019, con el mayor registro promedio anual en 2023 ($14 \pm 4,83$ individuos). Este sitio representa el apostadero más septentrional conocido para la especie, con una extensión de su distribución de unos 69 km más al norte con respecto al límite previamente informado para Punta Brava, Ecuador. La ubicación de este apostadero dentro de un área protegida puede facilitar el acceso controlado y la realización de observaciones que se repitan en el tiempo, ofreciendo una oportunidad para el monitoreo a largo plazo de la especie en el límite norte de su distribución en el Pacífico Sur Oriental.

Palabras clave: apostadero, Manabí, lobo marino sudamericano, león marino sudamericano, Otariidae.

INTRODUCTION

The South American sea lion, *Otaria byronia* (de Blainville, 1820), also known as the southern sea lion, is a pinniped widely distributed along the coasts of South America. Its presence on the Pacific coast of South America has been extensively documented from Zorritos Bay (03°40' S, 80°40' W) in Peru (Schefter, 1958), to the Diego Ramírez Archipelago (56°31' S, 68°44' W) in Chile (Pisano, 1972). On the Atlantic coast, it ranges along the entire coast of Argentina and Uruguay, including the Falkland (Malvinas) Islands up to Ilha dos Lobos (29°20' S, 49°42' W) off Torres, Brazil (Procksch et al., 2020). This species exhibits marked seasonal movements associated with its reproductive cycle, with the breeding season occurring between December and March in both the Pacific and Atlantic Oceans (Acevedo et al., 2003; Campagna, 1985).

Currently, the northern distribution range on the eastern South Pacific coast extends to Punta Brava (02°12' S, 81°00' W) in Salinas, Ecuador, where a haul-out site inhabited exclusively by males was reported (Félix, 2002). This finding, along with other records subsequently reported (Félix et al., 1994), indicates that the current distribution range of the species on the west coast of South America also includes the Ecuadorian coasts. Additionally, some individuals have been opportunistically documented in the Galápagos

Islands, Ecuador (Wellington & de Vries, 1976), Colombia (Capella et al., 2002), and even on Anatecampo Beach (13°24' N, 89°08' W) in El Salvador (Ibarra et al., 2016), though these records have been considered as vagrant animals. In this context, Isla Salango (Manabí Province, Ecuador) represents a suitable coastal environment for pinniped haul-out activity due to its proximity to productive waters and the presence of rocky substrates (Crespo et al., 2021).

This note documents a new haul-out site for *O. byronia* on Salango Island, extending the known South American distribution range. It also highlights the importance of monitoring this species in Ecuadorian waters to better understand its distribution dynamics at the northern edge of its range.

MATERIALS AND METHODS

Salango Island (01°35' S, 80°52' W) is a coastal island of approximately 1 km² located about 2 km offshore from the continental coast of Manabí Province, Ecuador, near the town of Salango and approximately 7 km southwest of Puerto López (Figure 1). The island is part of Machalilla National Park, which belongs to the National System of Protected Areas of Ecuador. The island is characterized by steep rocky formations, shallow coral reefs reaching approximately three meters depth, and a small white sand beach. It hosts breeding colonies of

blue-footed boobies (*Sula nebouxii*) (Sisilama & Vera, 2022) and is considered an area of ecological and cultural importance due to its role as a ceremonial center of pre-Columbian cultures along the Ecuadorian coast (Lunniss, 2019).

The haul-out site is located on a steep rocky slope on the northern coast of the island, partially covered with seabird guano. This area is highly exposed to wave action and can be difficult to access by boat, particularly during low tide.

Data were obtained from two sources: (1) direct observations conducted during five visits to Salango Island between August 27 and September 1, 2023, and (2) opportunistic photographic records collected between 2003 and 2024.

The 2023 visits were conducted within the framework of humpback whale research carried out by Pacific Whale Foundation Ecuador. All visits were made from Puerto López aboard a 12 m long motorized boat. Observations of South American sea lions were recorded opportunistically during these visits.

Direct counts of South American sea lions were conducted with the naked eye and binoculars from a distance of 5 to 20 m from the haul-out site, under favorable sea conditions. In addition to direct counts, photographs of the haul-out were taken with Canon EOS Rebel T3 camera equipped with an EF 75–300 mm lens. Indirect

counts from photographs were performed using the open-source program DotDotGoose version 1.5.1 (Ersts, 2020).

Photographic records of *O. byronia* at Salango Island from 2003 to 2024 were compiled by one of the authors (CC). For each date with valid observations, the total number of visible individuals was counted using the same open-source program. Counts were then aggregated by year to construct a temporal series of observations.

For both direct and indirect counts, age class assignment of each South American sea lion was based on external morphological characteristics described by Hamilton (1934), King (1983), and Aguayo et al. (1998). Age classification was performed by an experienced observer (LOG) with a high level of expertise in the identification of the South American sea lion age classes.

Throughout this manuscript, the epithet *Otaria byronia* is used following the taxonomic criteria recognized by the International Commission on Zoological Nomenclature (ICZN), the International Union for Conservation of Nature (IUCN), and the Society for Marine Mammalogy. The historical nomenclatural controversy surrounding the South American sea lion has been reviewed previously (Aguayo-Lobo & Oyarzún-Galaz, 2024).

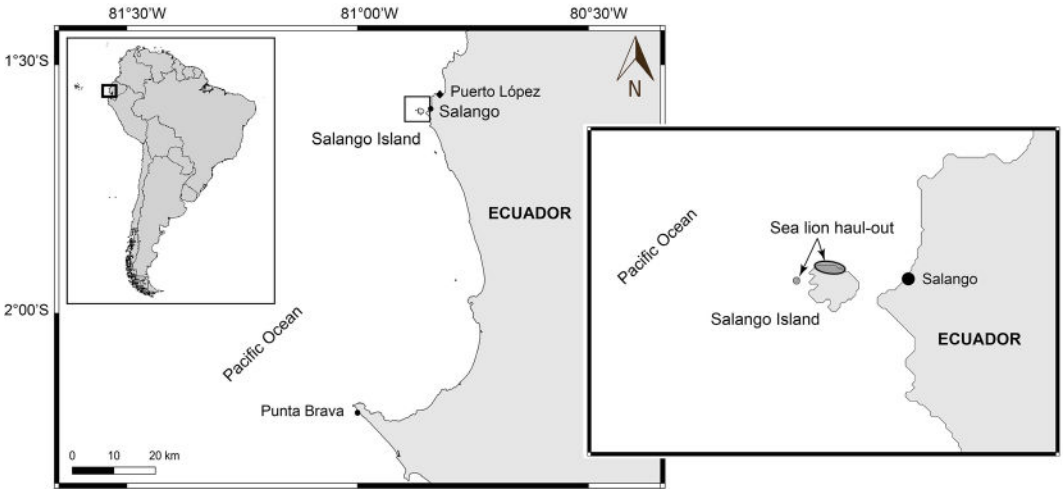


Figure 1. Location of the South American sea lion (*Otaria byronia*) haul-out on Salango Island and the previous known northern haul-out at Punta Brava, Ecuador.

RESULTS

Visit during 2023

The haul-out site on Salango Island was composed of adults, subadults, and juvenile males. All animals appeared to be in good physical condition, suggesting a generally healthy state.

The number of South American sea lions was highly variable during the five counts, ranging from 14 to 109 South American sea lions (Table 1, Figure 2). Overall, the presence of adult males was higher in all visits (> 60%).

Historical records (2003–2024)

A total of 73 records with *O. byronia* sightings at Salango Island between 2003 and 2024 were compiled (Figure 3), of which, except for three potential adult females, all individuals were adult, subadult, or juvenile males (Figure 4). The highest annual mean was in 2023 (14 ± 4.83 ; range 1–34). As shown in Figure 3, most records (67) occurred between April and November (i.e. outside the breeding season), with September showing the highest number over the years, followed by August. On the six dates with records between December and March, sightings involved only males: a single animal in four cases, and only on two occasions a group of three individuals.

DISCUSSION

The occurrence of South American sea lions on Salango Island extends the known Pacific dis-

tribution of *O. byronia* at least 69 km north of the previously documented limit at Punta Brava, Santa Elena Province (Félix, 2002). Historical photographic records indicate that South American sea lions have been present at this site since at least the early 2000s, with a more consistent presence observed since 2019. The observations obtained during visits conducted in 2023 provide additional confirmation of the current use of this site by the species during the non-breeding season. Most records corresponded to groups composed exclusively of males, consistent with the pattern previously reported for the Punta Brava haul-out in Ecuador (Félix, 1994). A similar seasonal pattern has also been described at the northern limit of the species’ Atlantic range, in southern Brazil, where males are seen almost exclusively from April to September, peaking in August–September (Sanfelice et al., 1999).

The establishment of South American sea lions at Punta Brava has been attributed to oceanographic events such as the 1997–1998 El Niño–Southern Oscillation (ENSO), which may have contributed to changes in the distribution and abundance of their prey (Félix, 2002), such as anchovies, sardines, and squids (Oliveira et al., 2012; Soto et al., 2006), as well as to ecological factors related to the increase in the Peruvian population due to protection measures implemented in Peru for the species (Majluf & Reyes, 1989). While the factors driving the presence of the species at Salango Island remain uncertain, the site appears to provide suitable conditions for haul-out and may associate with the availability of nearby food resources. It is also likely

Table 1. Date, time, and number of South American sea lion (*Otaria byronia*) counted on Salango Island in each visit.

Date	Time	Adult males (%)	Subadult and juvenile males (%)	Total number of individuals
2023-08-27	09:26	72 (66.1)	37 (33.9)	109
2023-08-28	12:27	17 (77.3)	5 (22.7)	22
2023-08-30	09:55	14 (100)	0 (0)	14
2023-08-31	15:14	30 (60.0)	20 (40.0)	50
2023-09-01	14:39	49 (73.1)	18 (26.9)	67



Figure 2. Group of male South American sea lions (*Otaria byronia*) at the Salango Island haul-out on different days between August 23 and September 1, 2023. Photos by Lautaro Oyarzún-Galaz.

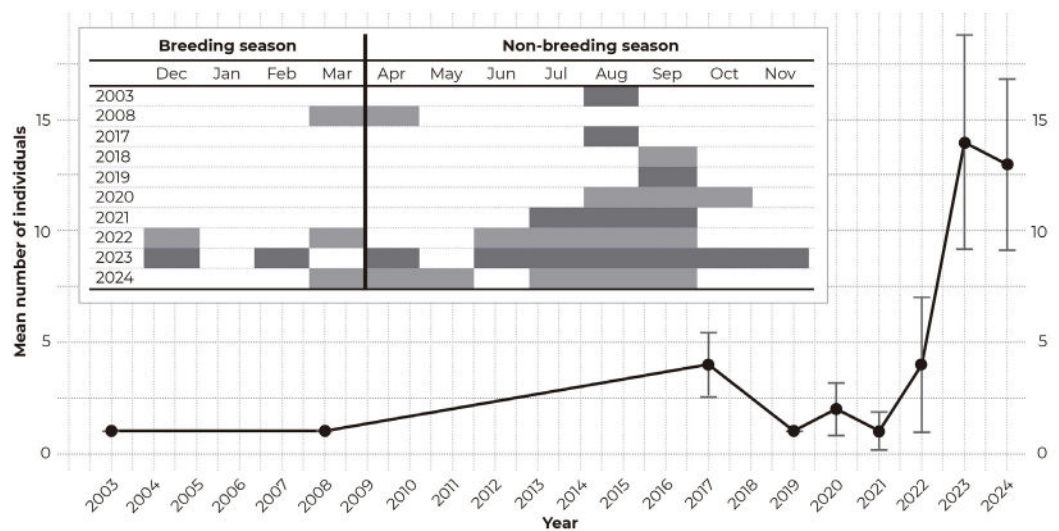


Figure 3. Annual mean sightings of South American sea lion (*Otaria byronia*) at Salango Island, Ecuador between 2003 and 2024. Points show annual means and error bars represent Standard Error. Data are derived from validated photographic counts. The table above the panel shown the months with recorded sightings during 2003–2024.



Figure 4. Historical records of South American sea lion (*Otaria byronia*) on Salango Island between 2003 and 2024: **A.** Subadult male, August 2003; **B.** Group of subadult and adult males, August 2017; **C** and **D.** mixed group of juveniles, subadult and adult males, August 2023 and September 2024. Photos by Cristina Castro and Lautaro Oyarzún-Galaz.

that the South American sea lions on Salango Island originate from Peruvian haul-out sites, as suggested by Félix (2002) for Punta Brava, where there has been an increase in population in recent years (Cárdenas-Alayza et al., 2016).

The exclusive presence of males of various age classes on Salango Island follows the pattern documented for the Punta Brava haul-out (Félix, 2002). Males of this species are known to undertake long movements along the coast (Giardino et al., 2016) and from the coast (more than 320 km; Campagna et al., 2001; Hückstädt et al., 2014), which may contribute to the establishment of new haul-out sites and connectivity among populations (Cárdenas-Alayza et al., 2016). Although isolated individuals have been recorded in more distant areas such as the Galápagos Islands, Colombia, and El Salvador, the high number of animals on Salango Island,

even surpassing those observed in Punta Brava, suggests that their presence is not recent. In fact, tourist activities for observing these animals on Salango Island began in 2003.

The increasing presence of *O. byronia* along the Ecuadorian coast may lead to greater exposure to anthropogenic threats. Castro et al. (2020) documented the historical use of sea lion carcasses as fish aggregating devices (FADs or “plantados”) by artisanal and industrial fishers, with specimens reportedly obtained from northern Peru. Although this practice appears to be less common today, local fishermen indicate that it may persist in some areas. In addition, growing tourism at Salango Island has increased vessel traffic around haul-out sites, potentially raising the risk of disturbance and accidents. For example, in January 2025, a tourist boat collided with rocks during sea lion observation after los-

ing stability. Sea lions may also damage fishing nets and consume catch, which can lead to negative interactions with local fishermen (Sepúlveda et al., 2007).

The geographical location of Salango Island, close to the mainland, facilitates access for repeated observations and monitoring. This makes a suitable site for medium and long-term studies aimed at improving our understanding of the dynamics, abundance, and behavior of *O. byronia* outside the breeding period, which remains one of the least studied aspects of this species.

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Author contributions: LOG and CC: conceptualization, writing of the manuscript, data collection and analysis. JA: conceptualization, writing of the manuscript, and supervision. AAL and EPA: writing of the manuscript and supervision.

Conflict of interest: The authors declare that they have no financial or personal conflicts of interest that could have influenced the work presented.

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