

Gulf of Arauco IMMA

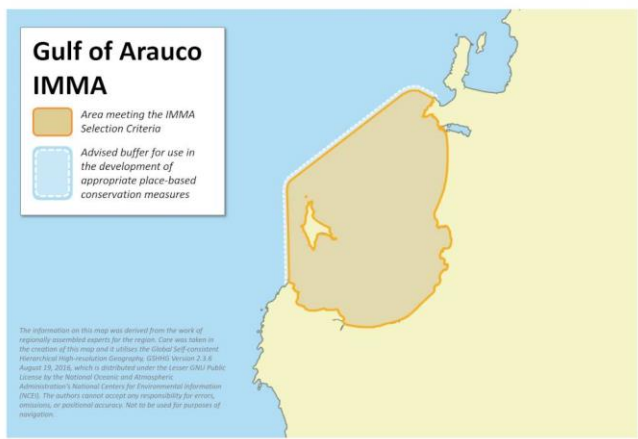
Summary, continued.

and the marine otter (*Lontra felina*). This area hosts one of the largest known populations of Chilean dolphins as well as the highest density of marine otters in Chile, and supports a breeding colony of the South American fur seal (*Arctocephalus australis*). Sei whales (*Balaenoptera borealis*) are also regularly observed in the Gulf of Arauco IMMA but more studies are required to understand their status in the area.

Description:

The Gulf of Arauco (37°S) is a 500 km² shallow embayment located off the central coast of Chile with an approximate "U"- or crescent-shaped opening (Valle-Levinson et al. 2003). Its western border is defined by Santa María Island and its northern boundary by the Bio-Bio Canyon that cuts through the continental shelf. This area experiences seasonal coastal upwelling, mainly during the austral spring and summer months (Daneri et al., 2000). The area is also strongly influenced by the Biobio river (36°S), which has a discharge of 1015.8 m³/s, creates some low salinity/estuarine habitats.

The high biological productivity that characterizes this area supports a large commercial fishery (Iriarte et al., 2012), and also allows the presence of a wide variety of marine predators, including mammals and birds. The area is extensively used by industries and coastal urban development.



Area Size

1 648 km²

Qualifying Species and Criteria

Chilean dolphin – *Cephalorhynchus eutropia*

Criterion A; B (1, 2)

Marine otter – *Lontra felina*

Criterion A; B (1)

South American sea lion – *Otaria byronia*

Criterion B (2)

South American fur seal –

Arctocephalus australis

Criterion B (2)

Marine Mammal Diversity

Eubalaena australis, *Phocoena spinipinnis*,
Mirounga leonina, *Balaenoptera borealis*

Summary

This IMMA represents one of the strongest upwelling zones located along the central Humboldt current system. Seasonal coastal upwelling, mainly during the austral spring and summer months, supports the survival of four marine mammal species that are frequently observed in this area, including two species of cetaceans, two species of sea lions, and the marine otter. Two of these four species are presently subject to grave conservation concern: the Chilean dolphin (*Cephalorhynchus eutropia*),

Criterion A: Species or Population Vulnerability

The Chilean dolphin (*Cephalorhynchus eutropia*) is listed as Near Threatened (NT) on the IUCN Red List of Endangered Species (Heinrich & Reeves, 2017) but it is listed as Vulnerable (VUc1) in the northern part of the species distribution under the Chilean Regulation for the Classification of Wild Species. The species' restricted geographical range, obligatory nearshore habitat, and the existence of two separate genetic lineages off the coast of Chile all give rise to conservation concern for this species (Pérez-Alvarez et al., 2015; Viddi et al., 2016). The marine otter (*Lontra felina*) is resident in this area, with its activities confined to an area not wider than 50 m on land and 150 m offshore (Medina et al., 2007). The marine otter is classified as Endangered (EN) on the IUCN Red List (Valqui & Rheingantz, 2021), and also by the Chilean Regulation for the Classification of Wild Species. These designations are based on inferred future population decline due to habitat loss and other threats (Valqui & Rheingantz, 2021). In Chile, this species is subject to habitat loss, bycatch in artisanal fisheries, and lethal attacks from dogs. Habitat loss has led to increased fragmentation of the otters' population (Medina-Vogel et al., 2008; Vianna et al., 2010). Despite official legal protections, there is very poor law enforcement in relation to activities threatening the marine otter's conservation.

Criterion B: Distribution and Abundance

Sub-criterion B1: Small and Resident Populations

A population of Chilean dolphins has been documented in Bahía Llico, in the Gulf of Arauco. Based on photo-identification of dorsal fins, Sepúlveda et al. (2020) and Valenzuela (2022) estimated that approximately 134 individual dolphins utilise the area. Some individuals were documented

to be present in the area year-round, which suggests that at least some individuals are resident (Sepúlveda et al., 2020; Valenzuela, 2022). Adults accompanied by calves have been also observed, which suggests the area is also used as a reproductive area. The home range of marine otters has been estimated to be less than 4.5 linear km of the marine littoral zone, which is heavily affected by human use (Medina et al., 2007). In the Gulf of Arauco, marine otters are present in three main areas, with Caicura hosting the highest density of marine otters reported for any single area in Chile (Sepúlveda et al., 2020; Guido Pavez, pers. comm). This Gulf of Arauco IMMA is therefore important for the conservation of marine otters in Chile.

Sub-criterion B2: Aggregations

Within the Gulf of Arauco IMMA, Isla Santa María constitutes an important site for the congregation of South American sea lions (*Otaria byronia*) in central Chile. In the summer of 2019, Oliva et al. (2020) estimated that 3,500 individuals were using the island as a haul-out. However, a year-round study in 2019-2020 found that abundance varied through the year, being particularly high in the austral autumn months when almost 10,000 individuals were counted (Sepúlveda et al., 2020). Traditionally, two different evolutionary significant units (or even subspecies) of South American fur seals have been recognized including the Peru/northern Chile and the southern Chile/Atlantic populations (Oliveira and Brownell, 2014), with a distribution gap in central Chile. Recently, Cárcamo et al. (2021) demonstrated the presence of South American fur seals in three colonies off central Chile within that supposed gap in distribution. One of these three colonies is Isla Santa María, with an estimated abundance of 246 ± 6 individuals (Cárcamo et al., 2021). A year-round study by Sepúlveda et al. (2020) in 2019-2020 found that the abundance of this species varies through the

year, with an increase in the number of individuals in austral autumn months to about 250 individuals. However, the evolutionary significant units to which these individuals belong has not yet been determined. Based on mark-recapture and photo-identification, Sepúlveda et al. (2020) and Valenzuela (2022) estimated an abundance of 134 Chilean dolphins in the Bahía Llico, in the Gulf of Arauco. This is one of the highest abundance estimates observed for a population of this species (Pérez-Alvarez et al., 2020).

Supporting Information

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