



Recent developments

Marine Reserve in Chile would benefit penguins and ecotourism

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ABSTRACT

The penguin colony at Puñihuil Islands, southern Chile, is the only known place where hundreds of Magellanic (*Spheniscus magellanicus*) and Humboldt (*Spheniscus humboldti*) penguins nest together. Current jurisdictional limitations leave the waters around the colony unprotected, and penguins are vulnerable to accidental drowning in gillnets. Ecotourism is an important industry for the small community nearby, but residents are frustrated that there is no mechanism to protect penguins and ecotourism. Designation of a Marine Reserve, with a participatory management plan crossing institutional boundaries, could offer protection to both wildlife and human livelihoods, and serve as a model for protecting natural capital.

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1. Introduction

On the northwest coast of Isla Grande de Chiloé in southern Chile (Los Lagos Region), a bay 25 km SW of Ancud holds three small islands where both Magellanic (*Spheniscus magellanicus*) and Humboldt (*Spheniscus humboldti*) penguins nest during the austral summer, from September to April (Fig. 1). Scattered 400–700 m offshore (42°S, 74°W), the uninhabited islands cover nine hectares and are in the overlap in ranges between these two closely related penguin species, as Magellanic penguins give way to Humboldt penguins in the north [1]. The colony is the only place where the two species breed in a mixed colony of significant size [1,2]. The colony contains over 500 Magellanic and 200 Humboldt penguins, and its documentation in 1985 extended the known range of the Humboldt penguin 900 km south [3]. In 1999, the islands were designated “Natural Monument Islotes de Puñihuil.” Under the IUCN Red List criteria, the Magellanic penguin is considered Near Threatened, and the Humboldt penguin is considered Vulnerable due to population declines. International commercial trade in the latter species is banned under CITES Appendix I [4]. The islands are currently managed by the Chilean National Forest Service (Corporación Nacional Forestal, or CONAF), but the waters around the islands are not protected. A national government response is needed to expand protection across current jurisdictional boundaries. National protection could serve as a model to local

communities that wish to protect natural capital for high environmental quality, sustainable ecotourism, and creation of local jobs.

Before the islands were protected in 1999, trampling by tourists landing on the islands and by goats on the nearshore island collapsed burrows, destroying breeding habitat and lowering penguin reproductive success [1]. When the islands became a National Monument, landing on the islands without permission from CONAF was prohibited, and CONAF removed all 14 goats. Subsequently, burrow collapse by people and goats is no longer a problem [3]. However, gillnet fishing for corvina (*Cilus gilberti*) poses a direct and serious threat to the penguins and other wildlife of Puñihuil. Gillnets of the type used to catch corvina, especially the drifting (rather than fixed) type, accidentally catch and drown Humboldt and Magellanic penguins in Chile and Peru [5–7]. This type of fishing is performed both by local and transient fishers, the latter visiting from more than 500 km away.

Fishing around the islands is governed by Fisheries and Aquaculture General Act (Ley General de Pesca y Acuicultura, or LGPA), through both the Under-secretariat of Fisheries (Subsecretaría de Pesca, or SUBPESCA, part of the Ministry of Economy) and the local fisheries council (Consejo Zonal de Pesca). Fishing activities, landings, and quota fulfillments are supervised and controlled by the National Fisheries Service (Servicio Nacional de Pesca, or SERNA-PESCA), enforced by the Chilean Navy when necessary.

We visited the area from 20 to 24 February 2006 and from 10 to 14 November 2008. We landed on the islands for biological research, went on ecotourist boat trips around the islands, and watched the tourism operations. We met with local stakeholders and discussed how the area was managed and what they felt should

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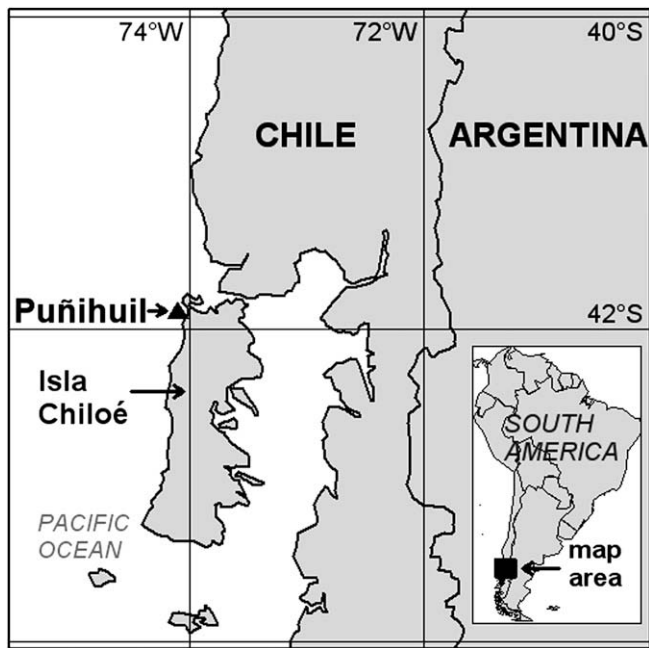


Fig. 1. The Puñihuil Islands, marked with a black triangle, are located off the northwest coast of Isla Chiloé, southern Chile. Inset map shows area enlarged.

be done, and determined their interests in the area. We became convinced that both the wildlife and local residents would benefit from the designation of a Marine Protected Area (defined by the LGPA) around the islands that would prohibit damaging activities and promote productive non-extractive activities like ecotourism.

The LGPA defines three categories of Marine Protected Areas: Management Area, Marine Reserve, and Marine Park [8]. A Marine Reserve is the appropriate instrument to protect the waters surrounding the Puñihuil Islands; Management Areas are focused on sustainable exploitation of benthic resources, and Marine Parks generally exclude fishing activities. A Marine Reserve is designated to protect breeding and fishing areas (for both pelagic and benthic species) within ca. 10 km from the coastline. Fishing is restricted to artisanal fishing during restricted periods, with specific regulations dictated by SUBPESCA. Marine Reserves are intended to protect genetic resources of native species, as well as certain (or all) stages of their life cycles, and any relevant ecological processes which impact the productivity and sustainability of the area.

To be effective, this Marine Protected Area would require a participatory management plan, designed with the relevant regulatory agencies at national, regional, and provincial levels, as well as affected and interested community members. Preventing accidental catches of penguins and other seabirds by fishing nets and promoting ecologically sustainable tourism should be a high priority for management, reflecting local interests in conservation, local job creation, and sustainable ecotourism. Management of the area would benefit from the participation of local community members, who are currently frustrated by the lack of mechanism to protect the penguins and promote sustainable development of the local ecotourism industry. Enforcing standards that protect natural capital protects jobs that depend on high environmental quality.

2. Economic activities

2.1. Extraction

Human settlements are located adjacent to Puñihuil, along a sandy beach opposite the islands. Here, there are approximately

12 permanent shacks, three restaurants on the beach, and about a dozen houses behind the beach. About 50 people (mainly fishers and their families) live there in the summer, although only a few remain during the winter months. At least 3 boats of Puñihuil residents have compressors that provide air for a diver to harvest mussels or other benthic animals. Among the latter, the “loco” (*Concholepas concholepas*), a Muricid gastropod, is one of the most valuable benthic resources in Chile [9]. The loco is subjected to a strong (illegal) fishery along most of the country’s coast due to the high prices it fetches in both national and international markets [9]. Algae collection is also a common occupation (people daily gather algae, sort it and set it out to dry on the beach for later collection and sale). Additionally, gillnets are used to fish for corvina and feral salmon. There does not appear to be any poaching or deliberate harm to the penguins or other wildlife in the area.

2.2. Ecotourism

Penguins are the key attraction for local ecotourism, facilitated by the proximity of the islands to the mainland and access city of Ancud. The local fishers, who transported tourists to the islands since the early 1980s [1], began in the mid-1990s to give organized tours around the islands and to professionalize their services [10]. Four tour operators – either former or part-time fishers – operate guided boat tours lasting approximately 30 min, taking between 5 and 9 people per boat [10]. They approach the island and view penguins (both Humboldt and Magellanic), sea otters (*Lontra felina*), flightless steamer-ducks (*Tachyeres pteneres*), kelp geese (*Chloephaga hybrida*), red-legged cormorants (*Phalacrocorax gaimardi*), and other wildlife. The working year for tour operators aligns with the breeding season of penguins, falling primarily between September and March. Tour operators abide by the rule forbidding landing without a permit, in accordance with CONAF regulations.

Prices for tours range from 3 to 8 USD per person, with interpretive information mainly provided in Spanish. Occasionally some tour operators offer guided tours in other languages (German and English) provided by non-native volunteers that seasonally stay at Puñihuil in exchange for lodging and food. We estimated that 20,000 tourists visit Puñihuil each season. A recent study [10] explored sustainable tourism capacity at the Puñihuil Islands and suggested that the gross community income from tours could range between 82,000 and 190,000 USD per year, depending on number of tourists transported and per person fees. The study finds that current tourist visits and logistics seem to be sustainable, but the study does not consider biological impacts of tourist number or trip frequency on penguin (and other fauna) behavior and ecology [10]. Furthermore, there are no barriers to expanded services or new operators as tourism increases.

3. Ecotourism structure

3.1. Ecotourism interests

Tourism has been formally described as the interaction of tourists, tourism brokers, and locals [11]. Applying this conceptual model to ecologically based tourism (ecotourism), ecotourists are ideally environmentally responsible visitors to natural areas which promote conservation, have a low impact, and promote social and economic well-being of local communities [12]. Brokers are those employed in planning or facilitating the tourist’s experience, such as planning and regulatory officials, non-governmental organizations, tourist guides, transport providers, and travel agents. In contrast, locals are the people who reside at the destination but are not employed in tourism. The divisions among groups in this model

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