

Rancher Perspectives of a Livestock-Wildlife Conflict in Southern Chile



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On the Ground

- Biodiversity is an important ecosystem service provided by rangelands. However, the close link between biodiversity and rangelands often results in conflicts between human livelihood and biological conservation, as is occurring with the livestock-guanaco (*Lama guanicoe*) conflict in Patagonia, Chile.
- Understanding community attitudes and perspectives regarding conservation is critical for successful conservation. We conducted a study to assess rancher perspectives of traditional land-use practices and biological conservation to identify incentives for, and barriers to, guanaco conservation.
- Ranchers strongly valued biodiversity and demonstrated stronger support for the cultural value, rather than economic value, of guanacos. However, a negative perception was associated with guanacos, and guanaco overabundance was identified as the primary cause of the conflict.
- Use of a sustainable-harvest approach of guanaco products, which emphasizes the commercial value of guanacos, may not be an effective conservation tool for the species under current conditions. Moreover, identifying the cultural carrying capacity, ecological carrying capacity, and minimum viable population of guanacos will be important in guiding conflict resolution.

Keywords: Chile, guanaco, livestock-wildlife conflict, Patagonia, ranching, Tierra del Fuego.

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that end [conservation], and that has value.” – Rancher, Tierra del Fuego, Chile

Rangelands play an integral role in the global well-being of human societies. Humans derive many goods and products from rangelands such as timber, grazing, and recreation. Many of the ecological processes that are critical to human livelihood, such as energy flow, water recharge, and soil development, also occur on rangelands.¹ In addition, much of the terrestrial global biodiversity may be found on rangelands.²

Biodiversity is an ecosystem service that historically has been undervalued but recently has garnered much societal support.² Biodiversity and its conservation increasingly are being valued by society on moral, ethical, and aesthetic grounds.³ However, the close link between biodiversity and the more utilitarian uses of rangelands often results in conflicts between human subsistence and biological conservation. One example of such socio-ecological struggle is the livestock-guanaco (*Lama guanicoe*) conflict occurring on the Patagonian steppe of southern Chile.

The guanaco is one of the most culturally and ecologically important species of South America (Fig. 1A). Guanacos played an important role in the culture of native people.⁴ They also helped shape the vegetation of the continent, being the only native ungulate to inhabit the Patagonian steppe since the end of the Pleistocene⁵ and historically were the most common large herbivore on the Patagonian steppe, numbering 30 to 50 million.⁶ However, guanaco populations declined drastically with the arrival of Europeans during the 1800s and the introduction of domestic sheep.⁵ Although several factors contributed to the guanaco decline, conflict with sheep ranching is considered a primary cause. The diets of sheep and guanacos overlap considerably, resulting in substantial interspecific competition.⁷ In addition, sheep grazing has resulted in vegetation shifts from palatable to unpalatable plants and has contributed to desertification of the steppe.⁸ Today, guanaco populations are estimated at about 500,000 to 600,000 and believed to occupy only 40% of their original range.⁴

Sheep ranching historically has been the primary land use in Patagonia and is a major economic force in the region (Fig. 1B). Conflict with sheep ranching therefore poses a real obstacle to guanaco conservation. Conservation agencies have

“[Wildlife] has many values. It forms part of the landscape, just as the prairie forms part of the landscape...It would not be perceived well if the guanaco was exterminated, if a bird was exterminated, or any other species. A culture now exists toward

A)



B)



Figure 1. A, The guanaco is a culturally and ecologically important species of South America. Guanacos played a vital role in the culture and economies of indigenous people and helped shape the vegetation of the continent. **B,** Unfortunately, the diet of sheep and guanacos overlap considerably and therefore a conflict exists with sheep ranching.

promoted the sustainable harvest of guanaco products as a possible solution to the livestock–guanaco conflict. For example, guanacos possess valuable fiber that can be harvested via live shearing and sometimes sold at prices competitive with sheep wool.⁴ Given this economic incentive, some ranchers are open to guanaco conservation, but social and ecological factors limit sustainable harvest of guanaco fiber as a conservation tool.⁹ Sociologically, a negative perception remains of guanacos; ranchers generally view guanacos as competitors with sheep despite their economic value. Ecologically, concern exists regarding the potential negative effects of live shearing on guanaco survival, reproduction, and behavior.⁸ Live shearing involves roundups of guanaco herds into corrals by people on horseback or motorcycle. It is unknown how the stress and risk of injury associated with the shearing process influence population viability of guanacos. Thus, sustainable use as a conservation tool for the species remains an undeveloped concept.

Conservation policies traditionally have employed preservationist strategies, such as refuges and law enforcement, to conserve biodiversity.⁹ However, preservationist strategies are limited because people need to use nature, and therefore value

nature, if biodiversity is to be conserved.^{10,11} An emerging paradigm in conservation biology is that biodiversity ultimately is achieved at the local level.¹² Consequently, understanding community attitudes and perspectives regarding conservation is critical if conservation is to succeed. Presently, it is unknown what livestock management goals govern ranchers in the Patagonian steppe of Chile and what barriers inhibit their engagement in biological conservation. As a first step toward exploring this human–wildlife conflict, we conducted a study to assess landowner perspectives regarding traditional land-use practices and biological conservation to identify incentives for, and barriers to, guanaco conservation in southern Chile.

Methods

Our study was conducted in XII Region of Magallanes (Magallanes, Ultima Esperanza, and Tierra del Fuego provinces), Chile. This region represented an ideal setting to investigate the livestock–guanaco conflict because the landscape contains large sheep estancias (ranches), national parks where guanacos exist without any sheep interactions, and areas where government programs have attempted to integrate guanaco conservation. The rancher community exists in a social landscape that is exposed to various degrees of guanaco conservation (i.e., traditional use of rangeland, preservationist approach, and sustainable use) allowing for a diverse breadth of perceptions.

We developed a survey to collect basic demographic data of landowners (age, gender, education level, size of estancia, and years of ranching) and assess their perspectives about three general themes: rangeland management, ecosystem sustainability, and biological conservation. The survey was a two-part questionnaire that consisted of structured and open-ended questions.

The structured portion of the survey consisted of 16 questions centered on the three themes and was designed to obtain specific information on the livestock–guanaco conflict. Response options included strongly disagree, disagree, undecided, agree, and agree.

The open response section of the survey consisted of 30 questions focused on the same three themes; however, questions were broader in scope (i.e., not designed to obtain information on a specific point of interest but rather general information on the socio-ecological system) and responses were open-ended, allowing survey participants the opportunity to fully expression their thoughts. The open questionnaire was based on grounded theory,¹³ which uses a systematic set of procedures to collect data and arrive at a conceptual model of social processes. Its goal is not to test existing hypotheses but rather discover an emergent theory of social processes that arise from participant responses.¹³ We used grounded theory as a guiding methodology because we did not have any preconceived mental models of the livestock–guanaco conflict, and our goal was to capture as accurately as possible the mental models of the ranching community. Past research indicates that it is critical to elicit local people’s view of their world as they experience it when exploring community perceptions.¹¹ Traditional hypothesis-testing research involving a preconceived theory therefore is not optimal in such settings; rather,

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