CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Transfer from Appendix I to Appendix II of the population of vicuña (*Vicugna vicugna*) of the Primera Región of Chile through a modification of annotations – 106 and + 211 adopted at the 6th meeting of the Conference of the Parties to CITES (Ottawa, 1987).

B. Proponent

Republic of Chile.

C. Supporting statement

1. Taxonomy

(Bonavia, 1996)

1.1	Class:	Mammalia
1.2	Order:	Artiodactyla
	Sub-order:	Tylopedia
1.3	Family:	Camelidae
	Sub-family:	Camelinae
1.4	Genus:	Vicugna
	Species:	*Vicugna vicugna mensalis* and *Vicugna vicugna vicugna*

1.5 Scientific synonyms:

1.6 Common names:

English:	vicuña
French:	vigogne
Spanish:	vicuña
Aymara:	wari, or huari

1.7 Code number:

2. Needs for the proposal

Article 1 of the Convention for the Conservation and Management of the Vicuña (Lima, 1979) states that the signatory Governments agree that conservation of the vicuña provides an economic production alternative for the benefit of the Andean population.

Within the countries signatory to the Convention, the Andean population generally constitutes a sector which is marginal from the conventional socio-economic perspective. Therefore, it is highly in the interests of the Convention to obtain maximum economic benefits from marketing vicuña wool and products made from it for the benefit of these communities.

Particularly in Chile, the concept of the Region I Andean inhabitants covers the Aymara communities, whose human settlements in the Andes predate the 16th century conquest of the Incas (Cordunap, 2002). This area of indigenous occupation comprises three of the poorest settlements in the country, and consequently there is great interest in implementing vicuña management systems there as an option for productive, economic and social development.

The conclusion from experiments conducted by Chile is that the entire vicuña population of Region I should be included within the local development process fostered through sustainable development of the vicuña. This means that the populations inhabiting areas outside the province of Parinacota, currently listed in Appendix I of CITES, could be managed in a sustainable manner in order to harvest their wool. However, the status of the Lauca site (containing 39.8 per cent of the national total) as a National Park precludes its vicuña populations from being used for this purpose.

3. Justification for the proposal

For more than 30 years, vicuña management in Chile has had a history of protection and conservation. Currently, actions taken to manage the resource – specifically, to harvest its wool – have led to a new phase in the management of this wild species. The involvement of the local Aymara community in exploiting the vicuña is, without doubt, one of the greatest milestones of change since the Government of Chile launched conservation programmes in the early 1960s.

The successful recovery of the species in Chilean Region I from a population of 2,176 in 1975 to a stable number of 16,899 in 2001 that has become self-regulating over the years through natural density-dependent processes, validates the international, national and local efforts made during these years. It must be pointed out that 96.9 per cent of the domestic vicuña population inhabits the Andean zone of Region I in Chile while the remaining populations (3.07 per cent) are distributed over Regions II and III. The management area of Lauca National Park, currently in Appendix I of CITES, contains a concentration of 39.8 per cent of the recorded population, namely 6,726 specimens.

In this effort, the need to base decision-making on adequate scientific and technical information has evidenced a growing demand to improve and perfect knowledge of the species and enhance the dialogue between the local community and government entities charged with protecting, conserving and managing the vicuña in Chile.

In view of this diagnosis, and in order to increase and strengthen local development options, the National Forestry Corporation (CONAF) for Region I proposed that a pilot project be created. The purpose of this would be to relate experience gained within the framework of the "Plan for Aymara Community Development through the Sustainable Use of the Vicuña within the Tarapacá Region" to the aspirations of Aymara livestock breeders of the Altiplano of the province of Parinacota, with regard to managing the undomesticated vicuña. This initiative, with support from the Small Subsidies Fund of the United Nations Development Programme (UNDP), gave birth to the project known as the "Pilot Plan for Harvesting Vicuña Wool in the Altiplano of the Province of Parinacota, Tarapacá Region" (GEF/CHI/97/G05). This initiative united ancestral experience in implementing the wildlife management system and the search for more modern systems for managing the species, including the sale of the wool and subsequent distribution of profits to the participants and beneficiaries of this activity.

Thus, the recovery of the wild vicuña population, together with experiments to conserve and manage it, along with the poverty affecting the Andean populace living with this species, give rise to powerful arguments for changing the Appendix in which this population is listed. This change has been desired for years and has already been acknowledged by the member countries of the Vicuña Convention at the 19th and 21st Ordinary Meetings of its Technical-Administrative Commission held in Riobamba, Ecuador (Resolution No. 216/99) and Oruro, Bolivia (Resolution No. 248/02) respectively.

3.1 Justification for harvesting and management systems and programmes

Wild vicuña management is not an exclusively modern phenomenon; there is archaeological evidence of numerous attempts to harvest vicuña wool prior to the Spanish Conquest. Currently, the concept of practical action is based on underlying concepts of sustainability touching upon two major ideas: the environmental sustainability of the system and the welfare of the animals involved. Added to the elements of wildlife management was a participative approach to management of resources traditionally linked to domestic service facilities, such as CONAF and the Agricultural and Livestock Service (SAG).

This system for managing wild vicuña in Chile is based on the development of a management model that uses the following studies and projects to encourage the merging of many terms and concepts and the analysis of variables that have made it possible to integrate knowledge into a conceptual proposition and management practice (Bonacic, 1996; Bonacic and Galaz, 1997; CONAF/IUCN, 1993).

Furthermore, based on the experience of having Aymara livestock breeders participate within the framework of vicuña management activities in Chile, a participative analysis was made of the proposed management conditions and, thus, the following model was designed.

3.2 Management and sustainability: basic concepts for developing wild vicuña management in Chile

The concept of wildlife management is based on the need to have complete knowledge of the structure, dynamics and interrelationships within one specific population and between it and other living communities of animals and plants as well as the physical environment. In other words, harvesting any wildlife species can be defined as an activity resulting from the integration of social interests, based on scientific, economic, technological and political values added to philosophical, ethical and aesthetic values (Bonacic, 1996), which coalesce into the consumptive use of a wildlife species. Currently, the action is directed toward what is known as 'sustainable management', which allows or models this type of harvesting subject to a condition of productive sustainability over time, without harming the animals in a way that entails individual suffering or a decline in the population.

3.3 Evaluation of the vicuña population in the Region I Altiplano

Since 1975, the CONAF has taken censuses of vicuña according to the method indicated by Rodríguez and Torres (1981), except in 1994, 1997 and 1998 when censuses were not taken, and in 1993 and 1996, when sampling was carried out.

The census area consists of a spatial schema proposed by Rodríguez and Torres (1981), which includes most of the province of Parinacota, Region I. Censuses taken within the rest of the country (Regions II and III) are neither systematic nor at regular intervals like those observed in the censuses performed in Region I (Galaz and Bonacic, 2000).

2001 Census results in Region I of Chile

According to the 2001 census taken by CONAF at 32 sites in the province of Parinacota, Region I, Chile currently has 16,899 vicuñas of the subspecies *V.v. mensalis* (Galaz and Urquieta, 2000), with an average of 563.3 specimens per site [standard deviation (s.d.) = 411.5]. Figure 1 below shows numbers per site and the associated density. The census site having the most vicuñas is Chungará, with 1,598 specimens and the site having the least is Quisiquisine, with 61 individuals.

Density for the total area was 3.43 vicuñas per km^2, with an average for the 32 census sites of 5.23 vicuñas per km^2 (s.d. = 5.14). The highest density was observed in Guane Guane, with 25.89 vicuñas per km^2, and the lowest was in Mucusa, with 0.39 vicuñas per km^2.

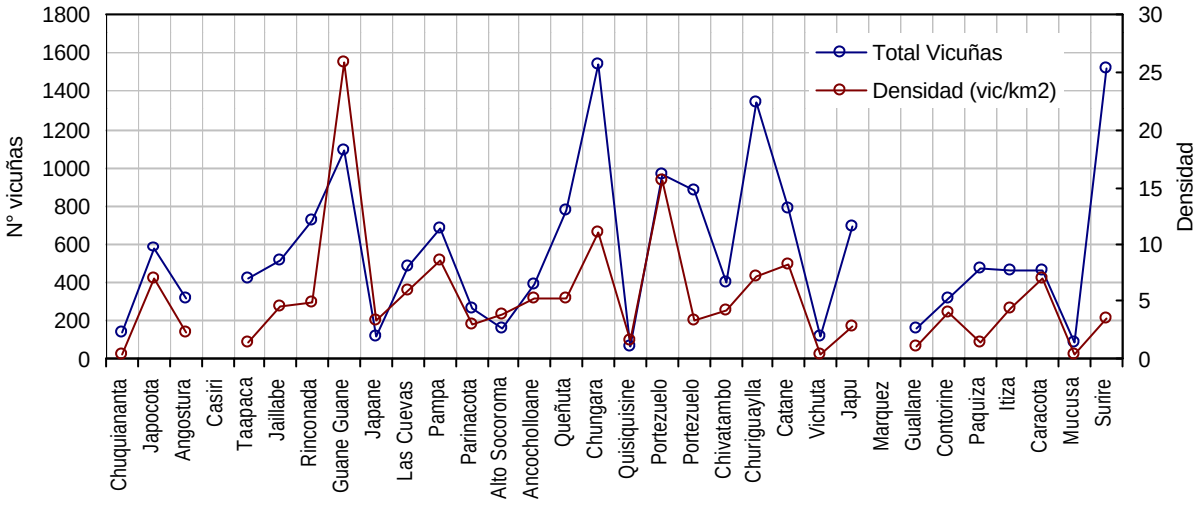

Figure 1: numbers and density of vicuñas per site in 2001.

Table 1 below is an illustration of the abundance and density of vicuñas per management area (see Figures 2 and 3), showing that the area with the highest density is the management area of the Lauca National Park while that with the highest number is the Las Vicuñas National Preserve.

Table 1.- Number of vicuñas and density per management area and total during the 2001 census.

Management area	**No. of sites**	**Total vicuñas**	**%**	**Area (ha)**	**Density**
Caquena	7	3,368	19.93	901.5	3.74
Lauca National Park	12	6,726	39.80	1,344.5	5.00
Las Vicuñas National Preserve	13	6,805	40.27	2,685.8	2.53
Total	**32**	**16,899**	**100.00**	**4,931.8**	**3.43**

The average family group for the entire census area was 1 male, 3.32 females (s.d. = 1.71) and 1.74 young (s.d. = 0.98).

The results of this census are similar to those of the 1999 census, presented as a report to the 20th Ordinary Meeting of the Vicuña Convention held in Catamarca, which would indicate that population levels have stabilized within the census areas.

It is important to note that the subspecies *V. v. vicuña*, which is established in the south of the province of Parinacota, was not systematically included in the Region I census. The populations of this subspecies distributed in other regions (Regions II and III in northern Chile) were likewise not included in the 2001 census. However, their numbers are estimated to be 3 per cent of the national total (Galaz and Urquieta, 2000) according to the history of the censuses in which they have been included, albeit intermittently.

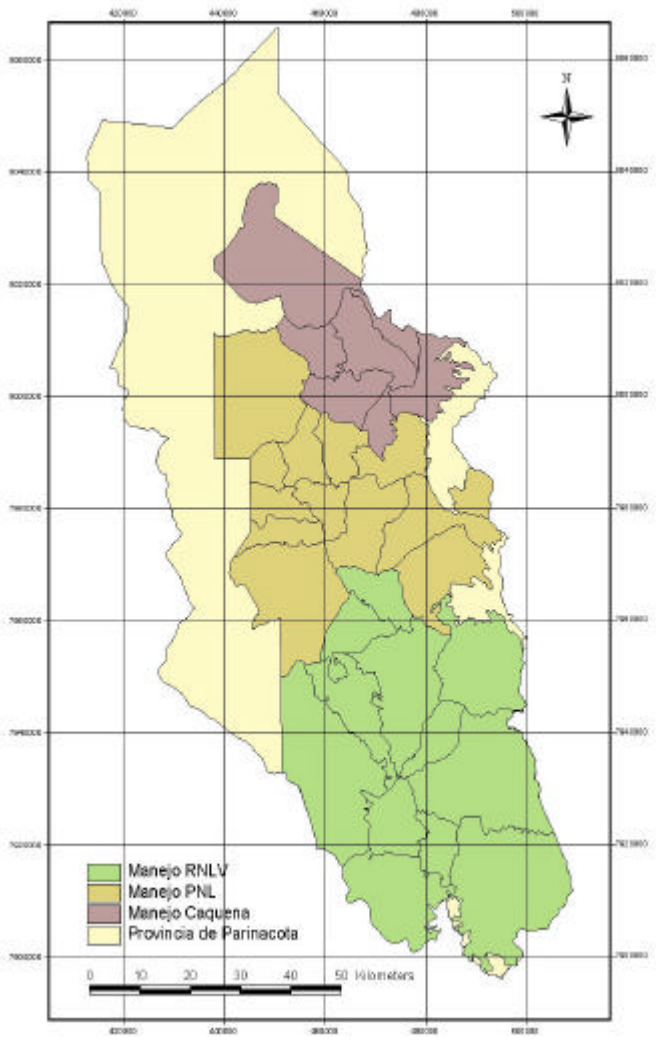

Figure 2: scale illustration of vicuña management areas, subdivided by census sites within the province of Parinacota, Region I, Chile.

3.4 Plan for Aymara Community Development Through Sustainable Use of Vicuña in Region I, Tarapacá

Ultimately, the inclusion of the vicuña into the development of the higher Andean regions of the province of Parinacota, specifically in areas with populations in Appendix II of CITES, has to be based on a concept of spatial incorporation in keeping with the Development Plan presented by Chile in 1993 (CONAF/IUCN, 1993), from the perspective both of social and economic participation and of environmental sustainability.

3.5 Pilot Plan for Harvesting Vicuña Wool in Region I, Tarapacá

The communities of the Altiplano, whose people are primarily Aymara, are among the poorest communities in Chile; meanwhile, a large part of these communities' territory has been declared Protected Wildlife Areas, a status that has changed the development prospects of the inhabitants. This has resulted in strong objections to this type of wildlife area by the people there. Moreover, a model for joint Government and Andean community management has never been developed as part of the Vicuña Conservation Plan administered by the National Forestry Commission (CONAF). This situation, which could well have been dealt with during the phase designed to protect the resource, must be resolved in view of the present recovery level of the species, which is currently in Appendix II of CITES.

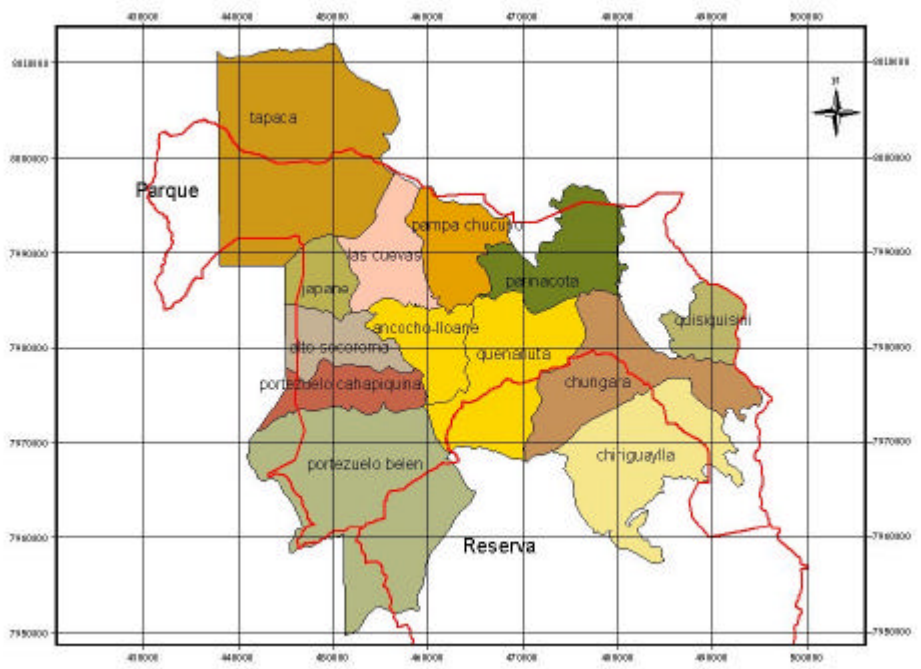

Figure 3: distribution of vicuña census sites in relation to the Lauca National Park management area. Parinacota, Region I, 2002.

3.6 Vicuña management in the wild and in captivity involving the Aymara communities of the Altiplano of Chilean Region I

As shown in the 1998 report submitted at the 28th Ordinary Meeting of the Vicuña Convention, the Government of Chile has been conducting the project known as Vicuña Management in the Wild and in Captivity Involving the Aymara Communities of the Tarapacá Region since 1999, with financing provided by the Agrarian Innovation Foundation (FIA). The latter is under the Chilean Ministry of Agriculture and its implementing unit is the Tarapacá Region CONAF, which has support and co-financing from the SAG for captive management, from the National Indigenous Development Corporation (CONADI) for wildlife and farm management, and from the Office of Agricultural and Livestock Planning and Policies (ODEPA) for the marketing model.

The project was launched on 1 July 1999 (ending July 2002). From Year 1, vicuñas were shorn in different locations in the wild for production purposes. Wool produced was sold, and all profits were distributed to the beneficiaries participating in these activities. At the same time, a marketing strategy was designed which began by researching the supply on the international market, forms of marketing, demand and an estimate of the domestic supply. Subsequently, the proposal was developed for the beneficiary partnering system, which is more suitable both for marketing purposes and for distributing the income from the sale of wool. The total project cost for three years of implementation was USD 613,000.

The primary objective of this project was to improve the living conditions of the Aymara communities living closely with the vicuña by marketing its wool, at the same time fostering the conservation and protection of the vicuña. Specific goals were: a) to validate the vicuña wildlife management system; b) to prepare a model for managing vicuñas in semi-captivity; and c) to design a marketing strategy.

Identification of the problem

The primary problem is that Aymara livestock breeders have not been included in the wild vicuña management program on a large scale and there is no model for managing vicuñas in captivity that would ultimately contribute towards generating income for these indigenous people.

The main problem can be attributed to the fact of the species having been in danger of extinction, which warranted legal protection banning the hunting and commercial use of the animals and its products from 1929 to 1987. In 1996, the new Wildlife Act (Law No. 19,473) was enacted, which enabled the SAG to authorize the sustainable use of protected wildlife species. This Act resulted in CONAF implementing the Pilot Plan for Harvesting Vicuña Wool in the Province of Parinacota during the 1997-98 season. The main obstacle this year is the lack of regional and national funds to keep wildlife management going and incorporate pilot experiments on captive management.

This species' successful recovery in this region, from a population of 2,176 in 1975 to 16,899 in 2001 (see Section C.3.3, Evaluation of the vicuña population in the Region I Altiplano) has had several negative effects on the production system of the Andean communities and, ultimately, on its inhabitants. Notable among these negative effects is the animal load of nearly 17,000 vicuñas on natural grasslands, which has probably contributed towards the degradation of these grasslands; competition for forage with domestic species (alpacas, llamas and sheep) (according to beneficiaries); less efficiency in animal management as reflected in their products (domestic stock having a lower live weight); and species management requirements that often translate into the outright rejection of vicuñas within Aymara pasture circuits, in turn directly entailing a decreased supply of forage for the species.

It should be noted that 96.88 per cent of the country's vicuña population inhabits the Andean area of Region I, while the remaining 3.07 per cent is distributed over Regions II and III.

Project background and justification

Implementation of the Pilot Plan for Harvesting Vicuña Wool in the Altiplano of the Province of Parinacota gave the first experience in harvesting this resource, thereby producing a change in vicuña management conditions and the participation of local livestock breeders. This, in turn, has given rise to new working options, which have been in place as of 1999 (CNG-CONAF, 1998). Another aspect, not attempted in Chile, involves pilot experiments on captive management.

For several decades, legal protection of the species has allowed this animal to survive and, over time, it has become an economic resource worthy of consideration. Knowledge of this wild animal and the development of a pilot plan for harvesting vicuña wool in the province of Parinacota by CONAF shows us that its economic exploitation is viable.

The exclusivity of vicuña wool causes its prized commercial value, which has increased over the last four years to high values per kilogram for fleece.

So far, the indigenous population directly affected by the existence of vicuña are the people living within the Andean sector of Region I, which are administratively within the municipalities of Putre, General Lagos and Colchane. These 3 municipalities are included within the National Plan to Overcome Poverty and involve a population of 3,167, of whom 1,453 are male and 1,714 are female. Analysis of the 1994 census shows an average monthly income of USD 48 for family units in the municipality of General Lagos and USD 72 in the municipality of Putre.

Introducing new activity to the area through harvesting vicuña wool will make it possible to contribute marginal income to the income structure of indigenous families and, ultimately, will contribute towards improving their socio-economic status.

3.7 Historical analysis of Chilean Region I, 1975 - 1994

Time dynamic

The vicuña population has grown since 1975, displaying the logistical growth modelled by Bonacic (1996) and Galaz (1998).

Mortality for each age was taken from the species lifespan table (Rodríguez *et al*., 1986). With this information, added to data on offspring from each annual census, we created a matrix whereby we estimated the number of specimens per age interval per year, tracking the different cohorts until we had the estimated annual value (Figure 4).

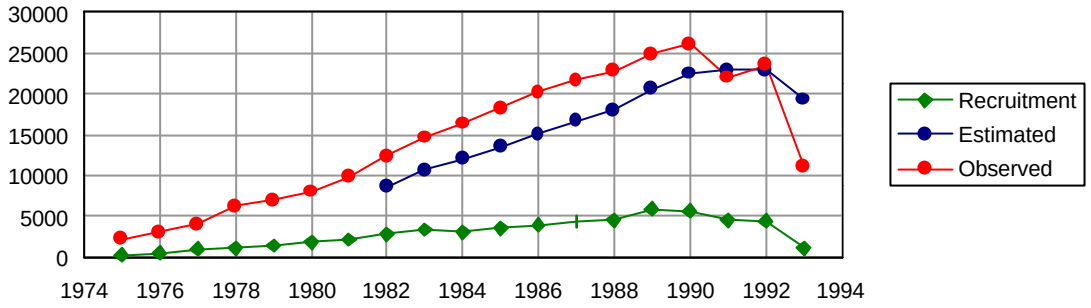

Figure 4: observed and estimated population growth and observed recruitment trend

Comparing estimated and observed values over the course of the years, no significant differences were found (t-Student, $p > 0,05$), which allowed us to estimate the future population. The vicuña population trend is an evident response to its protected status; however, another factor is its response to changes within the macro-area environment, such as periods of drought and high precipitation, which may increase or decrease the load capacity of its feeding areas. This can be fairly well covered by the inclusion of the recruitment of the year's surviving offspring in the population fluctuations, thereby making it possible to see a density-dependent process at work within the population.

Recruitment depends on the availability of food at each site, which allowed us to identify processes such as grassland depletion or migrations. For example, in Surire, recruitment decreased after 1990, while it kept increasing in Pampa Chucuyo until becoming relatively stable (Figure 5).

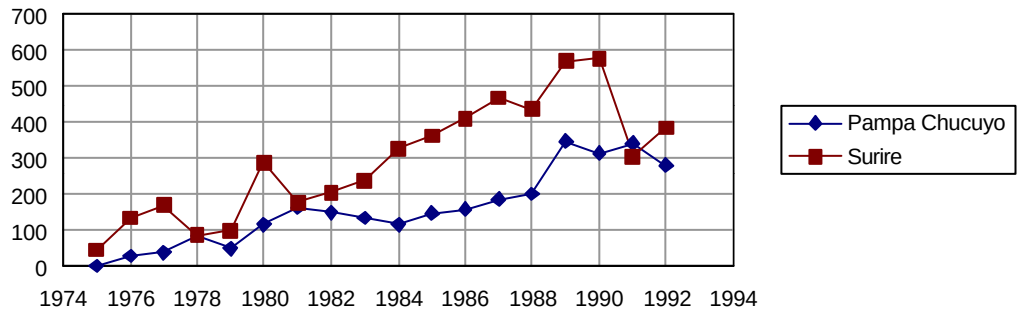

Figure 5: examples of recruitment trend observed at two sites.

Time/space dynamic

We must not limit our analysis of the census data to annual summaries, which do not adequately illustrate the dynamic of each site over the years. Therefore, we must determine what actually occurs at each census site.

Population fluctuations by site allow us to incorporate the concept of source and recipient population in terms of the colonization or re-colonization of new areas associated with the gradual population growth. From this concept, we can estimate the source and recipient sites (Table 2).

Table 2: sites identified as source and recipient

Sources	Recipients
Casiri	Japocota
Taapaca	Angostura
Jaillabe	Guane Guane
Japane	Parinacota
Las Cuevas	Japu
Pampa Chucuyo	Chivatambo
Ancocholloane	Churiguaylla
Chungara	Catane
Portezuelo Chapiquiña	Vichuta
Portezuelo Belen	Marquez
Paquiza	Guallane
Caracota	Contorine
Surire	Itiza

Discussion

Comparing the results of Regions I and II in terms of their age structure and male/female ratio, no differences are observed. The regions display the same trends even though different populations are involved, with significant numerical differences. As the Region II population was much less abundant than that of Region I, it was not included in the population growth analysis.

Studying numerical abundance and density is of great importance since this information can be used to determine the most important sites in terms of density and abundance. Moreover, it is possible to establish modelling per site to predict population behaviour. This allows the possibility of creating a ratio showing the degree to which density and abundance are correlated (Figure 6).

Based on this correlation, a matrix has to be generated using historic data per site and per year to characterize each site's behaviour over time.

According to the logistical growth model (Ricklefs, 1998), the population growth has already reached its maximum load capacity, as demonstrated by Bonacic (1996). This author calculates the load capacity to be 22,776 vicuñas.

When the populations reach their optimal size, they begin to fluctuate in response to environmental processes. The vicuña is governed by density-dependent processes whereby the population size of the species is self-regulated.

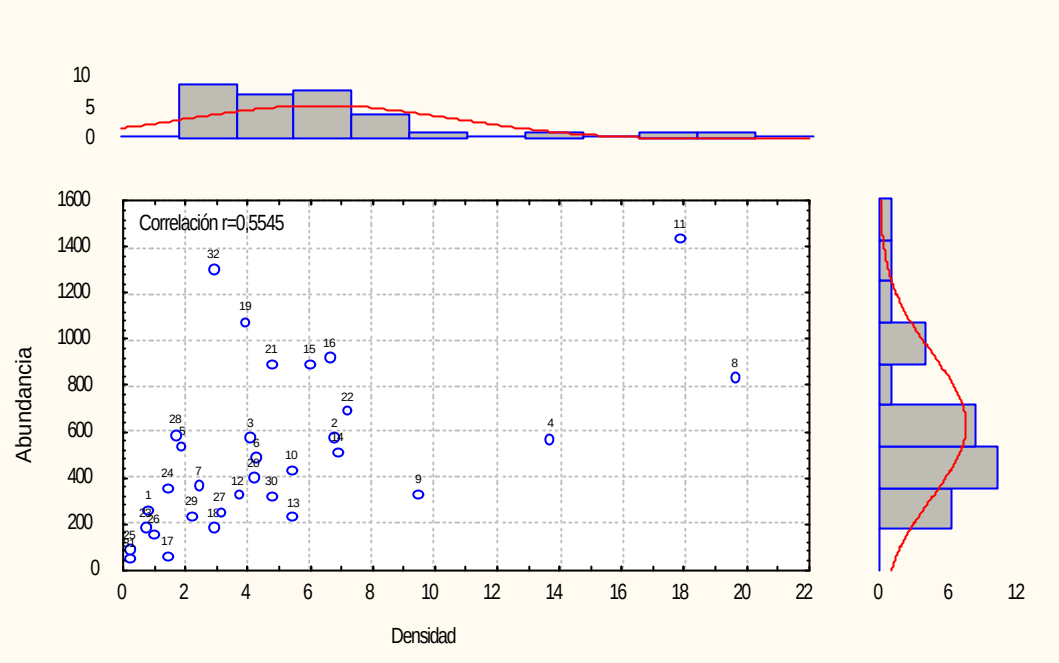

Figure 8: correlation between density and abundance of vicuñas per site in the 1999 census, including the distribution of frequencies of each variable.

In creating the population growth matrix, mortality values were used that may still have to be adjusted in order to be able to estimate population size; consequently there is a need to conduct new studies to create lifespan tables for the species.

It can be concluded that the size of the vicuña population in Region I is stable and that it is now necessary to define new analyses of existing data and to maintain the censuses of at least a significant segment of the population. For example, it may be enough to take a census of some sites comprising half of the population.

It may also be concluded that there is a 1:1 ratio of males and females; however, the unique territoriality of the species limits our ability to estimate the ratio adequately, as we do not know how many females there may be in the herds.

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