

## Habitat of the South American Camelids

The subcontinent of South America is comprised of 13 separate countries or territories and is the third largest land mass in the world. It contains the widest extremes of topography and climate and features the traditional and modern life and customs from many different sectors of human culture.

Along the western border of South America runs the high mountain range known as the Andes or *Cordillera de los Andes*. These mountains are relatively young and are still in the process of being formed due to the interaction of the South American and Pacific plates. Massive uplift has led to high, undulating land surfaces that contrast with the more continuous sharp relief of many other mountain systems.

Faulting, folding, and volcanic activity have produced a rugged and mountainous surface topography, while glaciation and erosion have created many deep valleys. The complex geological history of the Andes has produced a landscape of rolling, relatively flat plateaux, with occasional mountain chains rising above them (c. 6,000masl) and deeply incised gorges cutting into them. The term *puna* is used to refer to this intermediate zone, ranging in altitude from 3,700 to 4,800masl. It has relatively low relief and is characterised by bunch grasses and low herbage. It is this zone that constitutes the present habitat of the New World camelids.

Two general climatological seasons occur in this part of the Andes: a mildly warm, rainy, growing period from December to April and a cold, dry period from May to November. About 80 per cent of the rainfall occurs during the wet season and the remaining 20 per cent during the dry season in the form of hail and snow. Annual rainfall is within the range of 250 to 900mm, according to latitude, with very low precipitation in the southern part of the Andes. Weather data collected in the Department of Puno, where the Granja Modelo de Chuquibambilla is located (elevation at 3,850m), from 1931 to 1973, show the mean daily minimum temperature to be -3°C and the mean daily maximum temperature about 17.3°C. As in other high altitude regions, the diurnal variation in temperature is great, at times exceeding 30°C. At this high altitude there is low atmospheric pressure, a very dry climate, low oxygen availability, and intense solar radiation (high ultraviolet rays). In thin air, bodies absorb heat rapidly from the sun, and they lose it quickly when the rays of the sun are blocked by clouds. Moreover, wind, dry air, and low atmospheric pressure are all factors that increase the rate of evaporation.

These rugged conditions, both climatic and geographic, together with the low organic content of the soil, produce an unstable vegetation with a type of perennial graminiferous plant forming a discontinuous layer; and as a result there is little or no agriculture in this zone. Consequently, grazing camelids and, to a lesser extent, sheep, is the only alternative for the inhabitants of the highlands. By this means low quality natural pastures can be converted into useful animal products.

The *llama* (*Lama glama*) is the most cosmopolitan member of the SACs. Nowadays they are kept at elevations between 2,600 and 4,800masl and are found in south Colombia, Ecuador, Peru, Bolivia, Chile and Argentina. *Alpaca* (*Lama pacos*) rearing is restricted to elevations of 3,850m and above in Peru, Bolivia, and Chile. The zone with the greatest population and productivity is located between 11 degrees south and 21 degrees south latitude.

The *guanaco* (*Lama guanicoe*), unlike other SACs, lives in a variety of habitats. It thrives between sea level and 4,500m in either hot or cold, arid or humid zones. It is found in an area that extends from the northern part of Peru (8° S) through the *pre-cordillera* and coastal areas of northern Chile to Tierra del

Fuego, the southernmost region of Argentina and Chile. The largest population inhabits the *pampa*, or cold steppe, where "*coiron*" is the predominant vegetation.

Distribution of the *vicuna* (*Lama vicugna*) is limited to the *puna* zone of the Andes where they are most common at elevations of 4,200 to 5,200masl with a lower limit of 3,700m. The northernmost distribution of the *vicuna* at present is 9°30'S in the department of Ancash, Peru, and the southernmost limit presently is 29°0' in the province of Atacama, Chile.