The huemul in Chile: jeopardy?

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The huemul has vanished from much of its historic range in Chile and Argentina; now perhaps only 1300 are left. Since 1976, wildlife guards have been protecting huemuls in some parts of Chile and in 1977 a huemul guard station was built at the Rio Claro with ffPS support. In 1980–81 the author censused the known huemul populations in Chile and reports on their present status, evaluates the conservation measures that are being taken and recommends further action needed to save them.

The Chilean huemul *Hippocamelus bisulcus*, a cultural symbol in Chile, featuring in the national coat of arms, and a near legend, is a natural focus for wildlife conservation.

The huemul's medium size, short legs and low stocky build reflect its adaptation to irregular terrain. Adult males have typically bi-forked antlers about 20–25 cm in length (burr to tip of longer hind beam) with an additional third or rarely fourth point per antler, occurring in some individuals. The pelage ranges from pale to dark brown, often with a red, sometimes grey, orange, yellow, or gold cast. The colour also varies with light conditions and season, remarkably blending the animal with its habitat.

Originally, huemuls ranged along the Andes from about 34°S in Chile and 40°S in Argentina, spreading in Patagonia (south of 44°S) to Pacific coast islands and east along the highlands of Argentina possibly to the Atlantic coast (Cabrera and Yepes, 1960; Gigoux, 1929; Prichard, 1902). Today they appear to be largely gone from the entire region north of Patagonia except in the Nevados de Chillán (37°S) of Chile and Los Alerces National Park (42°S) in Argentina (IUCN, 1982). Most huemuls are found in Chile's Aysen Region with smaller numbers along adjacent areas of Argentina. Hunting has been a principal cause of the species's decline, but habitat destruction from fire and erosion, competition with domestic animals, livestock diseases, and killing by dogs are other important factors.

Census surveys were undertaken in Chile in December 1980 at the Nevados de Chillán (Ñuble) and in January and December 1981 at the Rio Claro (Aysen). Teams of 8–12 volunteers systematically examined blocks of Andean habitat on foot, and mapped huemul sightings and signs. Parts of these areas have been protected by the *guardafaunas* (wildlife guards) of Chile's Corporación Nacional Forestal (CONAF) since 1976, and in 1977, at the Rio Claro, a special huemul guard station was built with ffPS support. This paper uses the results of these surveys, the observations of *guardafaunas*, and other information acquired since the early 1970s, to report on the huemul's conservation status in Chile.

Nevados de Chillán

The only huemuls known to survive in Chile north of Patagonia are in the Nevados de Chillán. In 1975/76 the population was estimated at about 50 deer (Povilitis, 1978b) and the December 1980 census was intended to detect any changes in the huemul's status. Along the west and south-west sides of the Nevados de Chillán, patrolled by *guardafaunas*, the minimum

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national symbol in

Huemul buck with typical black face mask and bi-forked antlers.

count was eight huemuls compared with two in 1975/76. An area between the Rio Diguillin and Valley Renegado (south side) appeared to have been recolonised by huemuls from south of the Rio Diguillin, and fresh tracks and the remains of a male huemul showed renewed use along the north side of Valley Renegado. The atrophied antlers and the degree of tooth erosion of the dead huemul showed that he was old and probably died of natural causes.

Along the unprotected north side of the Nevados de Chillán (Rio Santa Gertrudis), however, the minimum number of huemuls was six compared with 11 in 1975/76, and huemul use of late-spring habitat had diminished, most notably at Cerro (Mount) Las Cabres, probably due to habitat deterioration from fires and increased numbers of livestock, particularly domestic goats. Also, the intense fear of man shown by three huemuls suggested human harassment. On neither the north nor the west side of the Nevados de Chillán was there any evidence of fawns, although *guardafaunas* reported a doe with a fawn at the Renegado (south) site that same month.

The results indicate that the huemul's status had

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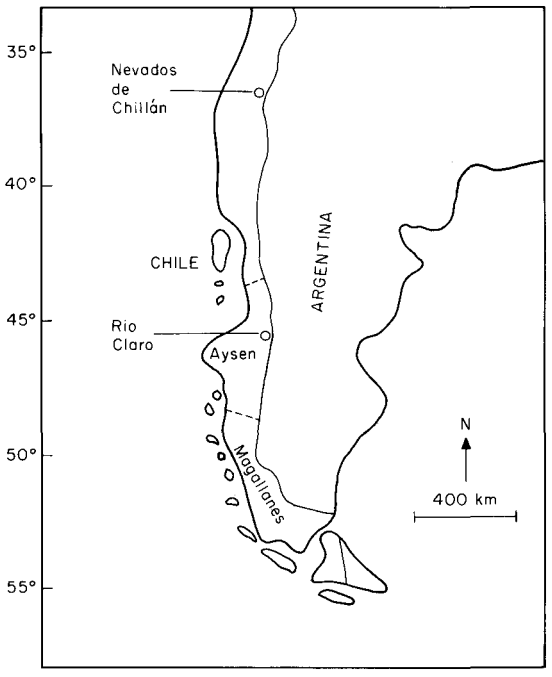

The Nevados de Chillán and Rio Claro: sites of the 1980/81 huemul census in Chile.

improved where anti-poaching and fire protection efforts had been made and deteriorated at certain non-protected sites along the Rio Santa Gertrudis.

Rio Claro

The Rio Claro, home of the most publicised huemuls in Chilean Patagonia, has native forest in various stages of succession, shrub vegetation along steep rocky sites and near the timber-line, and alpine meadows alternating with rock fields. Sites affected by human activity include pasture for domestic livestock, shrub-land recovering from fires, and sparsely-vegetated eroded slopes. The 1981 census included Cerro Huemules, which contains about 160 ha of successional shrub-land from which livestock have been largely excluded, and the more expansive Cerro Cordillerano and Cuatro Puntas immediately to the west.

The minimum number of huemuls at the Rio Claro was an encouraging 44, with nine at Cerro Huemules, 21 at Cerro Cordillerano, and 14 at Cerro Cuatro Puntas; 17 were adult males, six were adult females, two were yearlings, three were fawns, and 16 were unclassified. While most huemuls showed moderate fear of humans, several individuals near the guard station at Cerro Huemules could be readily observed at a distance of 30 m or less.

Most huemuls (48 per cent) were found along north-facing slopes of high topographic diversity (caused by ravines, cliffs, rock outcrops, etc.) and with small clearings in shrub and forest created by wind and fire. They (30 per cent) also occupied the high secondary valleys that partition the mountains. Huemuls frequented virgin southern beech forests (*Nothofagus* spp.), particularly those providing ready access to alpine meadows. As breaks in the forest canopy, made possible by fallen trees and limbs, allow sunlight penetration, these woods offer an abundance of forage at ground level. Huemuls (22 per cent) were also found in the zone above the tree-line. Trails worn by the deer just above the timber-line suggested that they routinely travelled between the forests of upper valleys and areas of habitat diversity along north slopes.

Huemuls seldom used severely eroded slopes and livestock pastures found on Cerros Huemules and Cordillerano. Many steep slopes at the Rio Claro, and throughout Patagonia, burned

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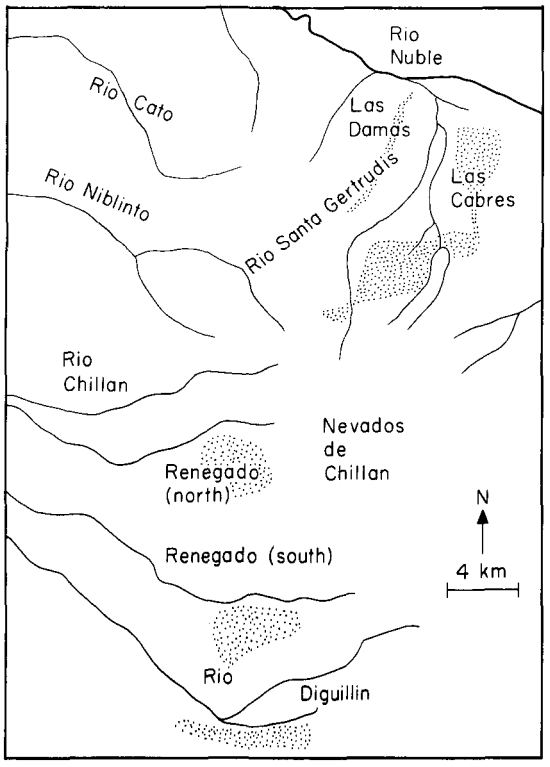

The Nevados de Chillán area of Chile showing sites (stippled) censused both in 1975/76 and in December 1980.

over in the mistaken belief that they would be as suitable as the pampa for livestock, have been largely lost to erosion. Areas intensely grazed by domestic sheep but with soil largely intact had shrub vegetation severely browsed or absent and only the hardiest herbaceous plants remaining.

Huemuls also seemed to avoid slopes broken by a series of long continuous cliffs and those heavily littered with fire-killed wood or overgrown with dense secondary vegetation resulting from past fires. Such conditions characterised large areas of Cerro Cuatro Puntas.

How many huemuls?

Providing an accurate estimate of huemul numbers is not easy, particularly when, under extinction pressure, they typically occur in small scattered groups in the most difficult terrain. Observations in Aysen suggest that the huemul may be distributed throughout the region in this manner; during the surveys conducted there in 1974/75, huemuls were detected at five of 11 sites where their presence was suspected (Povilitis, 1978b), but average minimum density was one huemul per 6·6 sq km.

Since 1974 their presence has been confirmed at 11 major sites (Hernandez and Rosas, 1979) totalling about 1300 sq km . Using the density estimate of 1 per 1.3 sq km obtained at the Rio Claro in 1981 would give an estimate of 1000 huemuls for the region. However, surveys by the author and *guardafaunas* in January 1982 of selected localities within these sites indicated that huemul densities generally were much lower. On the other hand, given that the density estimate at the Rio Claro represents a minimum and that huemuls undoubtedly occur at other, as yet unreported, sites, a population estimate for Aysen of 1000 seems reasonable.

Thus an upper estimate for the huemul's entire range is about 1300 deer considering that the Andes of Argentina south of 44°S provide roughly a third of additional mountain terrain where huemuls may survive. Unfortunately, huemuls have been reported only in three of the national parks of this region (IUCN, 1982).

Conservation requirements

More important than an estimate of total huemul numbers is an understanding of its conservation requirements and whether or not they are being met. If the protection granted by *guardafaunas* to huemuls at the Nevados de Chillán and Rio Claro has been as effective as it appears, a foremost requirement is to minimise mortality and stress from poachers and domestic dogs. The importance of doing so is further suggested by an apparent correlation in Aysen between the strict

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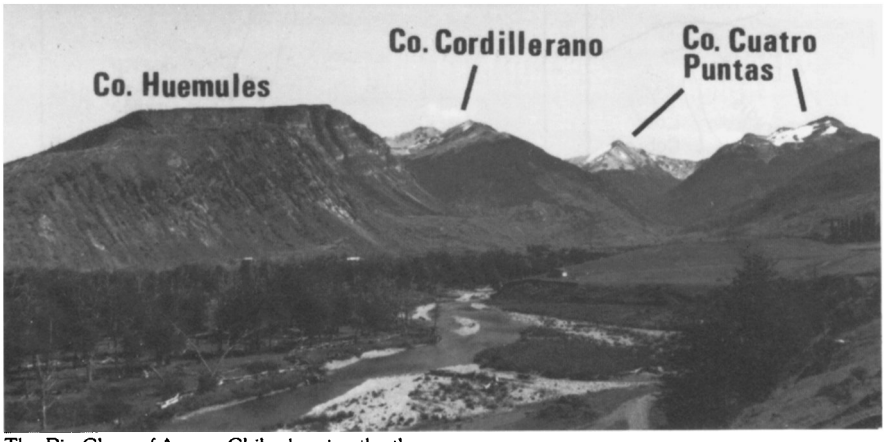

The Rio Claro of Aysen, Chile showing the three principal mountains on which the 1981 census took place.

control of firearms since 1973 and an increase in huemul sightings, if not numbers, in recent years (Hernandez and Rosas, 1979).

A second requirement is adequate vegetation for cover, shelter and forage. The importance of cover was driven home when I observed a group of free-ranging dogs approach two huemuls that had been resting on a small overhang above the Rio Claro. Sensing the dogs, the huemuls escaped uphill where dense vegetation finally impeded pursuit. But what if a fawn had been present? Substantial loss of vegetative cover at the Nevados de Chillán and Rio Claro, particularly along the lower slopes, may account for the low number of fawns recorded for these areas. Where shrub and forest cover has been thinned by fire or tall grass removed by livestock there is little protection for fawns, whether from predation or cold, wet spring weather. Protection from severe weather is important for older huemuls also, especially in winter when food is scarce and of poor quality.

Huemuls feed primarily on herbaceous plants and shrubs (Povilitis, 1978b; Colomés, 1978). Favourable foraging areas include those where rock and ice movement, wind storms, volcanic activity, elevational variability in climate and soil, and other physical factors have helped to diversify habitat. As is evident at Cerro Huemules, areas recovering from man-caused fires of 40–50 years ago also provide excellent browse. While limited disturbance may diversify plant growth and enrich huemul habitat, widespread burning in combination with grazing by domestic livestock has the opposite effect. Goats, sheep, cattle, and horses on steeper slopes preclude vegetation recovery and, with heavy winter rains, ensure severe soil erosion. While the goat seems to be the huemul's most direct competitor for food, competition among all foraging animals can be anticipated when food is scarce.

Other habitat requirements for the huemul include access to water, a clean environment, and sufficient space. During a dry period at the Nevados de Chillán in 1976, huemuls clearly favoured localities having fresh water (Povilitis, 1978) and they have been reported to enter rivers and lakes, perhaps to condition their coats or ease their muscles. The need for a clean environment relates to the threat of disease and parasite transmission from domestic animals; foot-and-mouth disease, coccidiosis, intestinal worms, and the louse *Bovicola caprae* all may be transmitted to the huemul by domestic bovids. Huemuls are also susceptible to bladderworm, *Cysticerus tenuicollis*, infection from dogs' faeces (Povilitis, 1978). The amount of space required by the huemul varies with season and habitat condition. During autumn 1982 I observed that one Rio Claro doe travelled within an area of at least 44 ha, while small groups at the Nevados de Chillán used seasonal areas that ranged from 70 to 188 ha (Povilitis, 1978). At the Nevados, home areas were found to shift with season, making annual home ranges up to five times larger than those of any single season. Some huemuls simply moved a short distance along a given mountain with changing season; others travelled distances of up to 6.5 km between summer and winter areas.

For both the Nevados de Chillán and Rio Claro, certain habitats are critical for the huemul. In summer, forests of upper valleys provide cover, forage and, in drier areas, water. They may also serve as important breeding sites and as travel

The Rio Claro Valley: many steep slopes were burnt in the mistaken belief that they would provide grazing for livestock, but erosion is the result.

routes. Huemuls avoid high valleys where forest has been largely destroyed and where livestock use is heavy. In winter the low steep north-facing slopes serve as critical habitat. As well as being warmer, the greater rates of snowmelt on these slopes mean easier travel and more accessible food. Since such areas generally receive substantial use by livestock, sufficient winter habitat must be reserved for huemuls regardless of the quality of summer habitat.

Conservation efforts

The placement of *guardafaunas* by CONAF at the Nevados de Chillán and Rio Claro signalled the treatment of these areas as de facto reserves for the huemul. Under current authority, *guarda-faunas,* in monitoring the huemul and its habitat at key sites, can help prevent poaching and the unauthorised use of fire and wood resources. Additional authority is needed, however, to reduce livestock competition with the huemul for forage and space, minimise the threat of disease transmission, and allow restoration of soils and vegetation. One option would be to include these areas within a national system of protected wild areas (CONAF, 1980). The extension of the Rio Simpson National Park 5–7 km to the south-east would bring the Rio Claro within park boundaries.

Efforts are being made to reintroduce huemuls to Torres del Paine National Park in the Magallanes region and to establish a captive herd at a private reserve near Santiago. The logical source for these huemuls is Aysen but public concern there compelled CONAF's regional director to assure residents that the small number taken would not adversely affect the huemul's status. As of January 1981, five huemuls had been released in Torres del Paine and six were on the private reserve, to the sacrifice, however, of a number lost during capture attempts (Astorga, 1980).

Interest in the conservation of this living national symbol continues to grow. A documentary on the huemul, filmed in part during the 1981 census, has been prepared for National Television. In Aysen, CONAF is considering the potential of the Rio Claro for tourism as well as additional field studies on the huemul and a local government project in Aysen may adopt huemul conservation as a priority item. There is no doubt that a desire to save the huemul prevails in Chile. Realisation of that goal will depend on a determined and sustained effort.

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Claudio Godoy, the wildlife guard/technician, and his wife, Ely, outside the guard station in the Rio Claro Valley which was built with ffPS support.

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