

Patagonia: Range Management at the End of the World

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Cold, disagreeable winters, arid steppes with fierce winds at all seasons—mixed with a bit of mystery, romance, and adventure—is the image that arises in the minds of people when the word “Patagonia” is brought up. While many similarities in climate and vegetation exist between the semiarid lands of Patagonia and those of the western United States, as well as similarities in the early settlement of these regions, several key differences have led to contrasting philosophies in the management of their respective rangelands. In Argentine Patagonia, livestock breeding for high quality meat and wool to satisfy the demanding markets of Europe was foremost, and care for the land was secondary. In contrast, management of western United States rangelands has tended to emphasize appreciation of both livestock and vegetation. The cultural and ethnic backgrounds of the early settlers and the concentration of wealth, educational institutions, and political power in the Argentine capital, Buenos Aires, have played a major role in the development of Patagonia. This article examines some of the historical and cultural factors that have led to the development of these two divergent land-use philosophies and their effect on range management practices in the United States and Patagonia.

The Land

The Patagonian region of the Argentine Republic extends from the Colorado River in central Argentina to the Beagle Channel in the south and from the Cordillera de los Andes to the Atlantic Ocean. It covers an area of about 1 million km² or about 1/3 of the total land area of Argentina. The climate is generally dry, cold, and windy. Below-freezing temperatures can occur throughout the year, and annual precipitation varies from more than 4,000 mm in the Patagonian Andes to less than 150 mm in central plateau of Patagonia. Since only about 4.5% of Argentina's population of 30 million people inhabit the Patagonian region, this wide and expansive land is indeed sparsely populated.

Although vast uninhabited steppes create an impression of desolation for visitors, not all Patagonia is arid and semiarid. The Patagonian Andes, for instance, is a highly scenic region with majestic mountain peaks. Several national parks with lakes, forests, and glaciers of magnificent scenic beauty occur there. The city of Bariloche, the main skiing center of South America and considered by some to be one of the world's beautiful cities, is located in this Andean mountain range. Other popular tourist attractions of Patagonia include numerous indigenous animal species such as the rhea, guanaco, and mara; the marine mammal reserve at Península Valdés; and Usuahia, the southernmost city in the world.



Argentina, like the United States, lies almost entirely in the temperate zone of the western hemisphere. Patagonia (hatched area) is a semiarid shrub steppe region, of which nearly 90% is rangeland. Comodoro Rivadavia is Patagonia's largest city, and is the center for commerce and industry in the region.

These notable scenic areas and cities may sometimes obscure the fact that the majority of Patagonia—nearly 90%—is rangeland. Forested land accounts for only about 10% of the Patagonian region, and irrigated valleys less than 1%. Patagonia is thus truly the rangeland region of Argentina. Vegetation throughout this vast cool semidesert/steppe zone consists mainly of tussock grasses (bunchgrasses referred to as *coirons*) intermixed with shrubs. Dominant grass genera include *Festuca*, *Poa*, *Stipa*, *Bromus*, and *Hordeum*, and the major shrub genera include *Nassauvia*, *Berberis*, *Mulinum*, *Adesmia*, and *Senecio*. The physiognomy, or overall appearance of Patagonian vegetation, is somewhat similar to that of many shrub steppe vegetation zones of the western United States rangelands. Soils of Patagonia vary from humic in the forests to alluvials and lithosols in Patagonian tablelands. The article by Soriano (1983) is suggested for a detailed review of the climate, vegetation and soils of Patagonia.

Colonization

The coast of Patagonia was first explored in 1518 by members of the Magellan expedition. Prominent scientists and explorers such as Darwin, Ameghino, Musters, and Dusen mounted several significant expeditions of scientific

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discovery to this region in the last century. Until the opening of the Panama Canal in 1914, the arduous journey around the South American continent by way of the Strait of Magellan was the only way to travel from the Atlantic to the Pacific Oceans by sea. Although there were many opportunities for settlement during this period, where coastal ports were used to resupply the ships, this region was apparently uninviting because of its cold climate and high winds.

It was not until 1865 that effective settlement of Patagonia was realized when a small group of Welsh immigrants established two settlements in northern Patagonia. The prosperous city of Puerto Madryn was established at the original landing site, and the city of Gaiman was established about 70 km to the south by the Chubut River. Within 25 years, other settlements were developed along the Chubut River. The Welsh colony developed sufficiently to support agricultural systems based on irrigation and a railroad to interconnect those settlements with the exporting port of Puerto Madryn. Additional settlements were also established on the foothills of the Andes, now the cities of Esquel and Trevelin. Immigrants from several other European countries followed later, and by the turn of the century the entire Patagonian region was fully explored. By 1920, ranches or *estancias* based on a sheep livestock industry as well as coastal meat packing factories and ports had been established.

Development of a Sheep Livestock Industry

In the first decades of this century the Patagonian economy was based entirely on the sheep industry, which expanded vigorously. The importation of rams from Australia was a practice commonly used for improving the quality of Patagonia sheep herds, a practice that is still quite common. Despite the impetus for industrial and economic development of Patagonia that came in the early 1900's with the discovery of oil in the region, the economic base of Patagonia remained largely dependent on the sheep industry for meat and wool production. To put the prominence of Patagonia's livestock industry and the region's natural resources in perspective, the Patagonian rangelands since settlement have produced more than 5 billion kg of wool—enough wool to make a sweater for every human on earth today—, 15 billion kg of meat, and more than half the energy (oil, coal and hydroelectricity) that Argentina has consumed up to the present. Unfortunately, economic benefits to Patagonia were minimal because most of these resources were export-



Sheep raising is the main activity on Patagonian rangelands.

ed from the region to develop Buenos Aires and the surrounding humid pampas. In recent years depressed wool prices on international markets coupled with increased growth of new textile, aluminum, and fishing industries have caused the traditional and once powerful Patagonian sheep industry to decline in terms of gross income.

Range Management Practices

Today, range management in Patagonia primarily involves the raising of sheep for wool and meat production. Although cattle ranching along the Cordillera de los Andes is becoming an important industry, particularly in response to the



Vegetation deterioration and soil erosion are the main problems caused by overgrazing on Patagonian rangelands.

growing markets for beef in several coastal cities, it remains a relatively minor industry compared with sheep ranching. There are about 350,000 cattle in Patagonia, quite a small population relative to the 16 million sheep.

Sheep management has always been quite simple, with the herds maintained in the field yearlong. Animals may be moved between summer and winter ranges on ranches near the Andes in western Patagonia, though overstocking on both ranges tends to deteriorate the land in a similar manner as yearlong grazing (Soriano 1956b). Utilization of coastal valleys as winter ranges, which are milder in climate and closer to meat markets, is becoming quite common. A few ranching events are noteworthy: the *señalada* (counting of new lambs), *esquila* (sheep shearing), *pelada de ojos* (shearing around the eyes), and *baño* (dip) against an ectodermic parasite called *sarna* (mange). In the estancias workers typically have the daily tasks of fence maintenance and searches for wounded or dead animals. Skin obtained from the dead animals provides an additional source of income.

Exhibitions of livestock, wool, and meat are held annually in towns throughout Patagonia—commercial and highly festive events called *La Rural*. Livestock improvements have earned the sheepherders of this region world-wide recognition for high quality wool and meat. This reputation has been known to swell the pride of the sheep breeders or *cabañeros*. Although several sheep breeds occur in Patagonia, only two are very important. Australian Merino sheep, renowned for their high quality wool, are generally raised in the arid areas of Patagonia because of their hardiness. In areas with semi-arid and colder climates, the Corriedale breed used for both wool and meat is commonly found. Some half-breed black faced sheep are raised in coastal valleys to produce lambs of excellent quality.

Improvements to the range are not common, and are certainly not encouraged by the relatively low sale price for wool. Although some estancias practice sound range management based on empirical observations, basic information on the Patagonian rangelands such as plant productivity, animal carrying capacity, range trend, range condition, and proper use are badly needed in order to design grazing systems based on ecological principles. This need for more information on range science, and especially the need for an organizational structure to guide and implement sound rangeland management, is magnified by rangelands that are, on the whole, in relatively poor condition.

Ethnic and Cultural Factors

Attitudes toward rangelands appear to have been greatly influenced by the land-use philosophy developed during the colonization of this region by European immigrants. As in the United States, Patagonia was settled by immigrants from many different European ethnic backgrounds. Welsh immigrant established farms along the Chubut River and in the foothills of the Patagonian Andes. The Scots, English, and Germans tended to be dedicated sheepherders, colonizing the arid steppes, constructing fences and sheep handling facilities in the estancias. People of Italian, Yugoslavian, Spanish, and Arab origin tended to settle in the cities and dominate commerce.

These ethnic and cultural influences lead to rangeland practices that focused primarily on the quality of livestock with little regard for the vegetation that supported the animals. The vast shrub steppe expanses of Patagonia appeared

to these late nineteenth century European settlers as an inexhaustible resource for livestock production. This philosophy fostered little desire for the conservation of these *inexhaustible* rangelands. Low regard for the shrub steppe rangelands of Patagonia was reinforced by the establishment of agronomy and veterinary colleges north of this region near Buenos Aires, which, with little exception, tended to emphasize development of the humid pampas. The less productive lands of Patagonia, viewed as marginal for agriculture, were accorded slight consideration. The lack of interest and understanding of such *marginal* ecosystems inhibited the development of range science. Only recently has concern for more than just the animal and its performance become of general interest of Argentines. Range science as a whole, then, has been a field nearly absent in Patagonia.



Festuca pallescens grassland on the foothills of the Patagonian Andes.

Woolfolk (1955) stated that English, Scottish, and Australian sheepmen carried to Patagonia their ways and habits of handling livestock. The vegetation of the new ecosystem they encountered was unfamiliar to them, thereby making it difficult to manage. These groups therefore focused on the more familiar and traditional ways of livestock breeding. In the words of Woolfolk, "*the knowledge of range vegetation and its management was not and still is not comparable with the general livestock handling and wool grading knowledge in the Argentine...*". This statement is true today, and even though the general improvement in herds quality is noteworthy, the condition of the range is today worse than 30 years ago.

Rangeland Research in Patagonia

In 1945, the young ecologist Alberto Soriano made the first observations of what could be called the *range approach* in this region. In a series of papers on Patagonia published between 1948 and 1956, Soriano implied that this region was an ecosystem essentially different in character from the agronomic humid pampas. Soriano stated that this "new" ecosystem should be managed ecologically, namely that secondary succession and not the production of new crops must be the dominant process utilized in range management. He suggested several ecological principles that should be followed to halt deterioration and improve the condition of the range, which by then was seriously threatened by

overgrazing. These included familiar concepts such as reduced stocking rates and deferred rotational grazing systems to allow secondary succession to proceed toward a climax community. While these recommendations seem quite reasonable to contemporary range scientists in the United States, one should remember that these views were formulated as early as 1945—and independently of the development of range science in the United States.

The series of articles by Soriano on Patagonian vegetation and its management were considered particularly significantly by Beetle (1954). In his review of the Argentine literature on range management, Beetle noted the lack of trained range extensionists in Patagonia. Furthermore, he perceived that thorough understanding of rangelands was hampered because almost all the botanists, taxonomists, plant geographers, and ecologists resided in Buenos Aires—far away from the rangelands of Patagonia. This impression was echoed by Woolfolk (1955) after visiting Argentina. Woolfolk was impressed with the excellence of Argentine ecologists and botanists, but recognized, as Beetle did, that most of those scientists lived in Buenos Aires and its surroundings. Woolfolk realized that development of range management required not only scientists with an appreciation and knowledge of the Patagonian ecosystem but also extensionists to transfer this knowledge to the rancher. He viewed this transfer of range research to the rancher as an indispensable step for the proper development and management of the range.

Range management curricula began to expand in universities throughout the western United States during the 1950's. This is in sharp contrast to the trend that occurred in Argentina during this period. Universities, centralized in Buenos Aires and La Plata, emphasized the agronomic and animal sciences. This fostered a production-oriented perspective of the rangeland, rather than one that was ecologically oriented. Agronomists and veterinarians educated at those institutions gave preference to improvements in livestock quality rather than to the ecology of the region. The results of these two different educational philosophies toward range management are clearly expressed in the present state of rangelands and range science in the United States and Argentina.

A considerable infrastructure has developed in the United States since the 1930's that guides the use, improvement and conservation of rangeland resources. Important in this infrastructure are the state and federal land agencies, university research and extension programs, ranchers, and concerned citizens. While there are often competing interests for the use of rangelands among these groups, management of rangelands in the United States tends toward a multiple-use approach. Although considerable scientific expertise in the agronomic and animal sciences does exist in Argentina, the consolidation of a national policy on management of rangelands as multiple-use resource has been slow to develop. The integration of such rangeland aspects as wildlife, vegetation management, conservation, and tourism with livestock production has yet to be achieved. The land-use philosophy still remains largely one oriented to the single-use purpose of animal production.

A substantial change toward Patagonian rangelands began around 1970, stemming from the noticeably deteriorated rangelands, a depressed sheep livestock industry, and renewed interest in Patagonia's oil and gas reserves. The general world-wide concern for environmental quality also

affected governmental policies toward land use and conservation. Various research groups began to focus their attention on vegetation, wildlife, soils, and environmental aspects of Patagonia. This change in attitude was reinforced by the creation of the *Centro Nacional Patagónico* in the city of Puerto Madryn. This research center, a branch of the National Research Council of Argentina (CONICET), has one program exclusively devoted to the development of arid and semiarid areas. Other research groups sponsored by the CONICET, the National Institute of Agricultural Technologies (INTA), and various state agencies initiated programs for collection of basic scientific information on soils, wildlife and vegetation. These programs were aimed at closing the gap in information that existed since the significant papers by Soriano in the late 1940's and 1950's. These procedures should lead to considerable improvements in the management of Patagonia's rangelands.

It is an appropriate time for Argentina to join the international community of range scientists. Local and national professional societies for range management, perhaps eventually to be affiliated with the international Society for Range Management, are needed to develop the scientific and governmental infrastructure necessary to halt rangeland deterioration and promote proper multiple-use land management. Support for improvement of rangelands should be cultivated among scientists, teachers, extensionists, ranchers, wildland recreationists and concerned citizens to forge a group that will influence the future of rangelands of this vast, mysterious and visually exciting land known as Patagonia.

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