The California rangelands comprise approximately 25% of California's land surface area, and have evolved over hundreds of years to current management practices and species now present. These rangelands played a central role in the history and legend of California, from the Spanish colonists to present-day generational ranching families. Through all its changes, rangelands still remain a diverse land type throughout California. The 2015 Society for Range Management meeting focuses on managing California rangeland diversity, a result of California's vibrant past.¹

**Spanish Era**

While Christopher Columbus imported European livestock to the New World in 1493, Spanish colonists did not bring cattle to California until they landed in San Diego in 1769. Two hundred head of cattle arrived by overland routes during 1769.¹ Additional missions followed in rapid succession and, by 1823, a chain of 21 missions extended along the coast from San Diego to Sonoma. Missions were colonizing agents of the Spanish government and were not intended to be permanent. Mission ranches occupied most of the lands in the coastal region held by the Spaniards, about one-sixth of the total area of the state. Burcham² estimated that more than 400,000 cattle, 61,600 horses, and 300,000 sheep grazed on the pastoral empire of the missions. The Spanish never extended their livestock husbandry into the Central Valley of California, but the local Indians acquired animals from the missions and drove them into the San Joaquin Valley. By 1819, they were breeding their own stock.³ Many of these animals escaped, resulting in large feral herds. McCullough³ cites numerous reports that observed herds of wild cattle and horses in the Sacramento Valley in 1849, the area around Petaluma in 1838, and other parts of Sonoma County in 1851.

**Mexican Era**

Mexico achieved independence from Spain in 1821, and California came under the control of the Mexican government. The 1824 Mexican Colony Law established rules for petitioning for land grants in California, paving the way for additional settlers to California by making land grants easier to obtain. This made land, such as the Russian colony's (Fort Ross), available to others. Found along the Sonoma Coast, this land is today a state park that can be visited to see how the Russians settled the area. The procedure included a *dis-eso* (a hand-drawn topological map) to define the area. The Mexican Governors of Alta California gained the power to grant state lands, and many of the Spanish concessions were subsequently patented under Mexican law.

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¹ For more information on the 2015 Society for Range Management Annual Meeting, see http://www.rangelands.org/events/.
Through the Secularization Act of 1833, the Mexican government repossessed most of the lands provided to the missions by the Spanish crown. Secularization was implemented between 1834 and 1836. The government allowed the padres to keep only the church, priest’s quarters, and priest’s garden. A commissioner would oversee the crops and herds, while the land was divided up as communal pasture, a town plot, and individual plots for each Indian family.

Although the original intent of this secularization legislation was to have the property divided among former mission Indians, most of the grants were made to influential Californios of Spanish background. The Mexican grants were provisional. The boundaries had to be officially surveyed and marked. The grantee could not subdivide or rent out the land. The land had to be used and cultivated. A residential house had to be built within a year. Public roads crossing through the property could not be closed. If the provisional conditions were not met, the land grant could be “denounced” by another party who could subsequently claim the land. From 1821 to 1846, more than 800 grants of land were made by the Mexican government. During June and July of 1846, a small group of American settlers rebelled against the Mexican government and proclaimed California an independent republic. The republic was short-lived as the US military began to occupy California. California joined the union in 1850.

**California Gold Rush**

On 24 January 1848, James Marshall discovered gold at Sutter’s Mill on the South Fork of the American River near Coloma. California would change dramatically as approximately 100,000 immigrant miners and fortune seekers poured in from all over the world during the first 20 months of the period known as the Gold Rush. By the mid-1850s more than 300,000 people had arrived. The population of San Francisco and Sacramento increased and turned these cities into boomtowns. This burgeoning population needed food, creating an enormous demand for beef and causing cattle numbers in California to quadruple and sheep numbers to increase more than 60-fold between 1850 and 1860. Large quantities of meat were now in demand at various mining communities and in the rapidly growing metropolitan centers of San Francisco, Sacramento, and Stockton. This strong demand, in conjunction with an extremely limited local supply of cattle, resulted in large numbers of livestock moving into California from Mexico, Texas, and other southwestern states. The Gold Rush created an enormous and ever-expanding demand for beef, raised the price of cattle to levels never before dreamed of in California, destroyed the simple scale of values to which the ranchers had long been accustomed, and transformed the herds of black, slim-bodied cattle into far richer bonanzas than the gold field of the Sierra yielded to a vast majority of the gold seekers.

By the end of 1853, 62,000 head had entered the state over the main immigrant roads, and were pastured in the San Joaquin and Sacramento Valleys while awaiting market. The sheep industry also grew during this period, with the gold boom resulting in an increase in sheep numbers from 1 million in 1859 to 4.1 million sheep in 1870 and 6.9 million in 1880. By 1855, cattle prices were declining in part because of the growth of the sheep industry in California and by 1856, cattle prices had dropped to $16–18 per head. During this time, at least 95 alien plant species occupied California’s grasslands and the conversion to introduced annual grassland was nearly complete. California was ideal cattle country with unending miles of green grass carpeting the hills with the annual winter rains. The livestock census in 1850 documented there were only about a quarter of a million cattle in the state. However, by 1860, over 1 million cattle were present with about 40% in the Sacramento and San Joaquin Valleys. Beef cattle numbers were about 1 million in 1870, dropped to 916,000 in 1880, and rose to 1.25 million by 1886.

Beginning in 1862, however, a series of climatic misfortunes paved the way for a major revolution in the dominant economy of the state. Prolonged rains began in December 1861, causing floods that paralyzed business and travel and drowned thousands of head of cattle, destroying possibly a fourth of the state’s taxable wealth. The Central Valley became an inland sea with runoff from the Coast Ranges and Sierra Nevada. The loss of cattle throughout the state amounted to about 200,000. The great flood, however, was followed by two years of unparalleled drought. Cattle prices dropped lower and lower as the drought continued, and enterprises such as wealthy stockmen Miller and Lux purchased starved cattle from the ranchos at $8 per head. A few months later, cattle were routinely slaughtered for the trifling value of their horns and hides. Henry Miller had arrived in San Francisco in 1850 and started a butcher business, eventually going into partnership with Charles Lux in 1858. The operation was headquartered in Los Baños and played a major role in the development of the San Joaquin Valley in the late 1800s and early 1900s. Miller figured out that putting up vast amounts of hay was crucial to surviving the periodic drought in California. Buying up ranchos devastated by floods, droughts, and low cattle prices allowed Miller and Lux to become one of the largest cattle producers in California and one of the largest landowners in the United States, owning 1.4 million acres of grazing land for cattle and farmland in California, Nevada, and Oregon (Fig. 1).

In the beginning of the Gold Rush, gold panning was the main method of finding gold, but by the end of the era, in 1855, panning had been replaced with industrial methods. The Gold Rush was over and many weary miners headed home but others liked what they saw and stayed. Those who stayed found the land unbelievably productive, and ultimately California's great wealth came not from its mines but from its farms. California, with its diverse population, achieved statehood in 1850, decades earlier than it would have been without the gold.
Public Policy

The Homestead Act of 1862 was signed into law by President Abraham Lincoln; anyone who had never taken up arms against the US government (including freed slaves and women), was 21 years or older, or the head of a family, and a resident, could file an application to claim a federal land grant. While many homesteaded the arable lands of the valley, most of the state’s areas of good grazing land were never claimed under this Act because they were not suitable for farming. These lands became known as the “open range.”

Unfortunately, from the 1880s to the 1890s, lands became decimated by the volume of cattle grazing them. In addition, flooding and drought so affected the cattle industry that many turned to sheep production, feeling that this class of livestock was better suited to the semiarid climatic conditions. This led to “range wars.” Ranchers fought against ranchers, which led to destroying livestock, hay, and corrals; they fought and even killed each other over the control of these valuable grazing and water rights. However, these catastrophes also had positive effects. Ranchers now had a better understanding of range feed for livestock production, and a demand for pasture improvement grew. Forages, especially alfalfa, were planted to supplement the natural vegetation.

The introduction of forage crops resulted in an increased demand for other agricultural crops as well, resulting in the period being referred to as California’s “Decade of Wheat.” Great acreages of valley land were diverted from range to wheat production. As settlement of the state proceeded and emphasis on farming increased, the era of cheap, free range for livestock ended in the valleys and certain portions of the foothills of California. The pastoral industry shifted to the upper margins of the grasslands and the woodland ranges of the foothills, and to the plateau and mountain portions of the state, where it became essentially stabilized. Ranchers were left to drive their animals to mountain ranges to find summer pasture.

Agriculture continued to increase with the conversion of native grasslands, which resulted in fence laws. Open range laws in California were created in the 1800s, requiring that small property owners and farmers be responsible for building fences to keep grazing cattle and other livestock off of their property. California described a “lawful fence” as one sufficient to prevent livestock from getting in or out of the enclosure. The property owner had to construct a fence at least 4 feet high, with firmly anchored posts no farther than 1 rod (16.5 feet) apart. The fence must have three tightly stretched barbed wires or something similar and be strong enough to turn livestock. Some California counties (Shasta, Modoc, Lassen, Trinity, and Siskiyou) were defined as grazing counties, where livestock were allowed to graze at will, referred to as free-range land.

In 1932, Walter W. Weir reported on erosion in California. While he focused mainly on land clearing and cultivation practices, he also implicated grazing in the widespread loss of soil in the Coast Ranges and Sierra Nevada foothills. From 1932 to 1938, researchers at the newly established San Joaquin Experimental Range photographically documented erosion on rangeland in many of California’s counties (Fig. 2). In 1936, Congress enacted the Soil Conservation and Domestic Allotment Act that allowed the government to pay farmers to reduce production so as to “conserve soil” and prevent erosion. It also led to the development of the Soil Conservation Service, now called the Natural Resource Conservation Service (NRCS).

Further development and change in California resource use saw the beginning of systematic grazing systems and range improvements. Animal numbers fluctuated, although they never attained the numbers of earlier periods. Livestock production practices also became more specialized with the marketing of younger animals, and feed-lot fattening.

Beef stocker cattle (younger cattle), became more common when cow/calf operations became less profitable. Younger cattle were acquired from the South and midwestern United States or were spring or fall calves from California. These cattle were brought in at the beginning of the forage-growing season and sold at the end when the forage was depleted. Stockers usually were finished for market on grain at feedlots.

When Congress passed the Homestead Act in 1862, there was plenty of land and no need for management classification of the public lands. After 1875, with the growth of cattle kingdoms and continued westward migration of homesteaders, conflicts arose over the use of public lands. The Public Lands Commission of 1880 recognized impending difficulties among public land users. While the commission’s recommendations were never adopted, the need was identified for special legislation to address grazing land specifically and to classify it for best possible use. In 1905, another Public Lands Commission suggested that federal grazing districts be created, but little was done. The Forest Service was created in 1905 to manage 68.3 million acres of National Forest lands. In 1919, the agricultural colleges that would become the University of Idaho and Montana State University were the first institutions to offer college degrees in rangeland

For more information on the California Open Range Law, see http://www.ehow.com/facts_7276629_california-open-range-law.html.
management. In 1922, the University of California’s School of Forestry hired Arthur W. Sampson, its first range management faculty member.13

During the era of homesteading, western public rangelands were often overgrazed because of policies designed to promote the settlement of the West and because of a lack of understanding of these arid ecosystems. In response to requests from western ranchers, Congress passed the Taylor Grazing Act of 1934, which led to the creation of grazing districts in which grazing use was apportioned and regulated. This Act sought to “stop injury to public grazing lands and provide for their orderly use, improvement and development.” This was accomplished by leasing the public grazing lands to ranchers who could provide hay and water on their nearby private lands. In 1946, the General Land Office merged with the US Grazing Service to form the Bureau of Land Management (BLM). The BLM now manages about 245 million acres in the United States.

With increasing pressure on public land use, the Multiple Use Sustained Yield Act of 1960 was passed. The government, responding to citizens changing demands on public lands, directed that National Forest lands be managed for “outdoor recreation, range, timber, watershed and wildlife.” This Act established the policy and purpose of the National Forests to provide for multiple-use and sustained yield of products and services. The Public Rangelands Improvement Act of 1978 established and reaffirmed the national policy and commitment to inventory and identify current public rangeland conditions and trends. It also committed to manage, maintain, and improve the condition of public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process. The Act required an equitable fee for public grazing use. Finally, it continued the policy of protecting wild, free-roaming horses and burros. The Federal Land Policy and Management Act of 1976 required that public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values.

Environmental legislation in the 1970s would have a huge impact on the range livestock industry. The National Environmental Policy Act was passed in 1969 and was followed in the 1970s by the Clean Water Act, Endangered Species Act, Coastal Zone Management Act, Wild Horses and Burros Act, Public Rangelands Improvement Act, and Federal Land Policy and Management Act. By the 21st century, private lands were being regulated to protect water quality and endangered species, creating conflict between the livestock industry and regulatory agencies.

The National Environmental Policy Act (NEPA) was created in 1969, and is a national environmental law that established a US national policy promoting the enhancement of the environment and also established the President’s Council on Environmental Quality (CEQ). As one of the most emulated statutes in the world, NEPA has been called the modern-day equivalent of an “environmental Magna Carta.” NEPA’s most significant effect was to set up procedural requirements for all federal government agencies to prepare environmental assessments (EAs) and environmental impact statements (EISs). An EIS, under US environmental law, is a document required by NEPA for certain actions “significantly affecting the quality of the human environment.” An EIS is a tool for decision making. It describes the positive and negative environmental effects of a proposed action, and it usually also lists one or more alternative actions that may be chosen instead of the action described in the EIS. EAs and EISs contain statements of the environmental effects of proposed federal agency actions. NEPA’s procedural requirements apply to all federal agencies in the executive branch. NEPA does not apply to the President, Congress, or the federal courts.

The Wild Horses and Burros Act of 1971 was passed to protect wild, free-roaming horses and burros from capture, branding, harassment, or death. This legislation prevented ranchers from disposing of excess horses and burros that competed with their cattle for feed and set up a long-running conflict between those who would protect the horses and burros, and the ranchers whose livelihood was being impacted. The BLM estimates that 40,605 wild

Figure 2. Rangeland soil erosion in California’s Coast Ranges during the 1930s.
horses and burros (about 33,780 horses and 6,825 burros) are roaming on BLM-managed rangelands in 10 western states, based on the latest data available, compiled as of 28 February 2013. Wild horses and burros have virtually no natural predators and their herd sizes can double about every 4 years. As a result, the agency must remove thousands of animals from the range each year to control herd sizes. The estimated current free-roaming population exceeds by nearly 14,000 the number that the BLM has determined can exist in balance with other public rangeland resources and uses. The maximum appropriate management level (AML) is approximately 26,677.

In 1972, the Clean Water Act set the basic structure for regulating discharges of pollutants to waters of the United States. While this Act did not immediately impact ranching in California and elsewhere, by the late 1980s, California's State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board began to seek voluntary compliance to the Clean Water Act by ranches throughout the state, especially in river basins where salmonids and other species of fish were endangered. In 1990, California's range livestock industry began to develop a program of voluntary compliance with the Federal Clean Water Act, federal and state coastal zone regulations, and California's Porter-Cologne Act, which provides for regulation of water quality by the SWRCB and 9 Regional Water Quality Control Boards. By 2004, control of surface runoff was mandatory and farms and ranches throughout the state were required to prevent runoff of pollutants from their property. Consequently many ranches have implemented best management practices to reduce livestock impacts on water bodies and riparian areas.13

The Endangered Species Act of 1973 was designed to “halt and reverse the trend toward species extinction, whatever the cost.” As habitat loss is the primary threat to most imperiled species, the Endangered Species Act of 1973 allowed the Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) to designate specific areas as protected “critical habitat” zones. In 1978, Congress amended the law to make critical habitat designation a mandatory requirement for all threatened and endangered species. This has led to conflict between ranchers and the USFWS on public and private lands but it has also resulted in cooperation that has protected habitat while allowing grazing and other ranch activities to continue.

**Sheep Industry**

At the beginning of the 20th century, sheep numbers in California were estimated to be about 2.2 million head. From the 1930s until 1940, sheep numbers increased to approximately 3 million3 and following World War II, the number of sheep declined to about 1.8 to 2 million. Between 1960 and 1970, sheep numbers decreased to 1 million or less and by 2000, sheep numbers were under 600,000. From the start of the 20th century to the end, sheep numbers in California declined by more than 70% and US numbers dropped 86%.

In 2005, the US sheep inventory increased for the first time in several years, due to the USDA Farm Service Agency’s Ewe Lamb Replacement and Retention Payment Program. Unfortunately, dry conditions in the major sheep states during the time of the program limited the number of ewe lamb replacements producers could hold back to help rebuild the breeding flock, and with the end of the program, sheep numbers declined.

Many factors have contributed to the long-term decline in the California and US sheep industry including sagging wool demand, low lamb meat prices, predation losses, the perceived threat of industry/packer concentration, and labor shortage. Lamb meat markets have remained steady and imports have increased to meet US consumer demands. Expansion and diversification of demand along with measures of quality control through feeding and breeding offer potential for industry recovery.

**Predator Regulations**

Predation losses have been one of the biggest contributors to sheep losses for large-scale sheep producers. Predators include coyotes, domestic dogs, mountain lions, bobcats, foxes, and eagles. More than 50% of the loss continues to be from coyotes.5

Gee14 reported that in 1974, coyote predation alone may have reduced gross US sales by $27 million, or 9%. In 1999, the direct loss from predation on sheep and lambs was estimated at $16.5 million, just over 3% of gross sales. In 1975, the United States spent $11 million on lethal measures to control animal damage.14

California Proposition 4, passed in 1998, outlawed several lethal tools used by the Wildlife Service to control predation losses. Since then sheep producers have had to rely on non-lethal methods, such as guard dogs, to help reduce predation losses. In 1999, US farmers and ranchers spent $8.8 million on non-lethal methods to prevent predation loss of sheep and lambs.

**Public Land Grazing**

By the 1960s and 1970s, public appreciation of public lands and expectations for their management increased and was addressed by the congressional passage of such laws as the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the Federal Land Policy and Management Act of 1976. Consequently, the BLM and Forest Service moved from managing grazing in general to better management or protection of specific rangeland resources, such as riparian areas, threatened and endangered species, sensitive plant species, and cultural or historical objects. The BLM developed or modified the terms and conditions of grazing permits and leases, implementing new range improvement projects to address these specific resource issues, promoting continued improvement of public rangeland conditions.
Today public land grazing is managed in a manner aimed at achieving and maintaining multiple resource goals and overall public land health. To achieve these desired conditions, the agency uses rangeland health standards and guidelines, developed in the 1990s with input from citizen-based resource advisory councils. Standards describe specific conditions needed for public land health, such as the presence of streambank vegetation and adequate canopy and ground cover.

Moving Forward

Two centuries of grazing and agriculture in California have greatly altered both the extent and character of the state’s rangelands. Approximately 14 million acres of the state are now under cultivation or occupied by urban and industrial areas. The greater part of this area—probably as much as 12 million acres—was originally in the California prairie and woodland plant communities, and hence was predominantly grasslands. Within the remaining grasslands, the most striking change has undoubtedly been replacement of the native perennial grasses by annual plants, mostly introduced from the Mediterranean region of the Old World. Destruction of the perennial grasslands occurred during the 1860s, when both the sheep and cattle industries were burgeoning. Even though livestock industry aided and abetted the survival and spread of the exotics, Burcham1 cited the view of others that some nonnative introductions preceded the first mission in 1769. Remains of three nonnative species found in the mission’s adobe bricks document that these early arrivals were able to compete with the native vegetation without the aid of livestock disturbance. It is likely that multiple interaction factors were important and that it was the interplay between the conditions on the grasslands and the specific biology of the invaders that led to widespread conversion.16

The development of annual rangeland management principles and practices can be traced back to early integrated research. This research started in the 1930s at the California College of Agriculture and at the USDA Forest Service San Joaquin Experimental Range (SJER) in the central Sierra Nevada foothills.17 Early rangeland management principles have emphasized resource values associated with forage and livestock production to vegetation management activities used to manipulate forage productivity, forage quality, and species composition. The emphasis on using ecological principles for rangeland management, principles, and practices now addresses multiple ecosystem services. With the addition of ecological principles, management decisions are based on the entire system.

The 21st Century

Ranching continues to maintain its prominence on rangelands in California; it is the most widespread land use and agricultural activity in the state. In the 21st century, California ranching is diverse, with ranchers owning or managing approximately 38 million acres of privately and publicly owned rangelands. Most ranches are family owned and operated with many of them managed by the fourth, fifth, and sixth generation. However, many of these ranches are smaller than in the past and cattle and sheep numbers are lower than earlier centuries. Public policies, especially environmental regulations, are influencing the management of ranches and practices and are changing to meet current needs and opportunities.

References


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