

THE HISTORY OF CATTLE GRAZING IN ARIZONA

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Range conditions in the southwestern United States have exhibited dramatic changes over the past 140 years—changes often attributed singularly to grazing of domestic livestock. However, conditions of certain rangeland watersheds within the state have stabilized, some even showing improvement. It can be argued that this is due to better stewardship of the land by ranchers, government regulation, and economic and social forces. This paper traces the probable cause and effect of management practices on changes in the number of cattle grazed and the amount of water utilized in Arizona between the turn of the century and the present.

Livestock Industry in Early Arizona

"The Livestock Industry in Arizona is almost as old as the white man's interest in and occupation and colonization of the territory" (Peplow 1958). Because neither cattle nor horses are indigenous to the region, the major products of today's livestock industry are transplants from other lands. So far as is known, the first horses were brought to the continent by Cortez in 1515 (Barnes 1926); the first cattle were imported to Mexico in 1521 by Gregorio de Villalobos (Peplow 1958). Padre Eusebio Kino stocked his missions in what is now southern Arizona with sheep, goats, horses, and cattle as early as 1700 (Roberts 1963; Peplow 1958). There are reports of active ranching of Andalusian (Longhorn) cattle in the region of La Aribac (Arivaca), as well as in other portions of southern Arizona in 1751 (Peplow 1958).

Between 1771 and 1811, missions on the Santa Cruz River reached the zenith of prosperity with the development of stock ranches on haciendas:

Most important of the ranches were those at San Bernardino, Babocomari, San Pedro, Arivaca, Calabasas, Saporí, Radenton, San Rafael de la Zanje, Sonoita and Tubac in addition to those in

the San Simon Valley, Agua Prieta and Pueblo Viejo. Sierra Bonita was perhaps the largest of the ranches, though they were all great plantations.

Most of the haciendas were on Spanish land grants which were originally made for the purpose of mining. However, livestock was brought to supply the miners with food, clothing and work animals. (Peplow 1958)

This prosperity came to an abrupt end with the resumption of Apache depredations in 1811 and the commencement of war against the Spaniards by the Navajos in 1818 (Peplow 1958). In the intervening years, the haciendas were abandoned and vast herds of feral cattle roamed free throughout the portion of Sonora that is now Arizona.

On October 31, 1857, J. R. Bartlett, who at that time was the U.S. Commissioner connected with the Gadsden Purchase, reported in a letter that he "saw thousands of head of cattle in southeastern Arizona in a region south of the Gila River and as far west as the Santa Cruz River" (La Rue 1918). Many of these cattle were wild, because the Spaniards had been driven off by the Indians. Mr. Bartlett's letter states, "On the haciendas where there were no ponds or streams the cattle obtained their water from the *pasos*, or simple wells, and the *norias*, or draw wells where the water was drawn up by a wheel worked by mules." According to La Rue (1918), this indicates that in the early days it was necessary to develop stock-watering places to fully utilize the range.

Past and Present Grazing Pressures

One hundred forty years ago the ranges of Arizona were considerably different from what they are today. An abundance of water and grass sustained the large herds being driven across the state from adjoining states and territories to California. Water was plentiful, feed abundant, and range almost unlimited in the 1860s and 1870s (Peplow 1958).

Between 1860 and 1870, a few white men tried to establish themselves in the stock business in Arizona. They were doomed to failure because the

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Indians killed new settlers or drove off their stock. It was not until the period 1871 to 1873, when General Crook rounded up all Indians in Arizona and placed them on reservations, that the stock industry flourished in Arizona. Shortly thereafter (1874–75), the Mormons, among others, pioneered the agriculture and stock industries in the state (La Rue 1918; Peplow 1958).

According to the census of 1870, there were only 5132 head of cattle in Arizona, but the industry grew rapidly during the 1870s and 1880s (Peplow 1958). The sheep industry also started in the 1870s when drought in California forced a surge of sheep eastward across the Colorado River and into the high, timbered plateaus of northern Arizona (Roberts 1963). "Most of Arizona's sheep summered on the Colorado Plateau in the White Mountains and in the Bradshaws. They wintered on the deserts on the Salt River and Gila River Valleys" (Roberts 1963).

From 1880 to 1900 there was a rapid increase in the stock industry in the West. Pioneer stockgrowers increased their herds to the full limits of the rangeland. By the mid-1880s, Arizona ranges were nearly all taken up and the flow of cattle into the state gradually came to an end (Haskett 1935). By the late 1880s, rangelands in both northern and southern parts of the state were beginning to show the effects of overstocking (Poling 1991). Range that had naturally been stocked with a few hundred game animals was now expected to support thousands of cattle. The grasses, which for ages had grown to the height of a horse and had been cut as wild hay by early settlers, were so decimated by the vast herds that they had little possibility of reseeding themselves. Periods of drought in the 1880s, which became acute in the early 1890s, also contributed to the demise of the lush grasslands (Peplow 1958).

By 1910, "the grazing lands were stocked far beyond their capacity with both sheep and cattle; vegetation was cropped by hungry animals before it had the opportunity to reproduce; valuable forage plants gave way to worthless weeds and the productive capacity of the lands rapidly diminished" (Roberts 1963).

The Era of Government Intervention

It was not until after the creation of the U.S. Forest Service in 1905 that there was any attempt to limit grazing on public lands. With the enactment of the Taylor Grazing Act in 1934, rangeland management changed from ranchers having free access to and use of public range to the practice of con-

trolled (fenced) grazing allotments (Poling 1991). The Bureau of Land Management (BLM) was established in 1946, during a period (1934–1976) of further controls on grazing through enactment of rules and regulations by the district advisory boards, and the careful expenditure of funds for range improvements, selection of knowledgeable personnel, and other routine management decisions (Poling 1991).

Modern rangeland management increased during the 1960s and 1970s, culminating in the National Environmental Policy Act (NEPA) of 1969. NEPA imposed a procedural requirement that federal agencies consider the effects of their actions on the quality of the environment, including preparation of Environmental Impact Statements (EIS) on the effects of proposed grazing on public lands (Poling 1991).

The Wild Free-Roaming Horses and Burro Act (1971) was an effort to improve rangeland conditions by controlling the proliferation of these animals. The Endangered Species Act (1973) requires federal agencies to consult with the U.S. Fish and Wildlife Service before making any decisions relative to rangeland management, to determine whether there would be any adverse impacts on threatened or endangered plants and animals.

The Federal Land Policy and Management Act of 1976 requires management of public lands on the basis of multiple use and *sustained yield*. The emphasis of the Public Rangeland Improvement Act (1978) is the inventory and management of public lands "so that they become as productive as feasible for all rangeland values" (Poling 1991; see Table 1).

Comparison of Stock Numbers: Past to Present

What effects have these changes in rangeland policy had on rangeland management in Arizona over the past 90 years? From 1911 to the present, the number of cattle grazed on federal, state, and private lands in the western states has decreased. The actual number of head on public and private lands in Arizona has decreased from 1,511,492 in 1918 to 840,000 in 1991 (Table 2).

Similar comparisons can be made of other stock animals. La Rue (1918) documents the number of horses in Arizona in 1918 at 136,648, the number of sheep at 1,713,064, and the number of goats at 418,370. The number of horses currently in Arizona is 166,000 (Russel Gumm, personal communication, June 29, 1993). Even though the number of horses has increased, the number of *range* horses

Table 1. Historic Overview of Land Effects in Arizona

Dates	Historic Milestones	Significance
Present	Effective range management between 1910 and the present	The actual number of head on public and private lands has decreased 45 percent overall from 1,511,492 in 1918 to 840,000 in 1991.
1978	Public Rangeland Improvement Act	Emphasis on the inventory and management of public lands so that they may become as productive as feasible for all rangeland values.
1976	Federal Land Policy & Management Act	Requires that public lands be managed on the basis of multiple use and <i>sustained yield</i> .
1973	Endangered Species Act	Requires federal agencies to consult with the U.S. Fish and Wildlife Service to determine whether there will be any adverse impacts on threatened or endangered plants and animals before making decisions relative to rangeland management.
1971	Wild Free Roaming Horses & Burro Act	Enacted to improve rangeland conditions by controlling the proliferation of such animals.
1969	National Environmental Policy Act (NEPA)	Imposes a procedural requirement that federal agencies consider the effects of their actions on the quality of the environment, including the preparation of Environmental Impact Statements (EIS) on the effects of proposed grazing on public lands.
1946	Bureau of Land Management	Placed controls on grazing through enactment of rules and regulations by district advisory boards, careful expenditure of funds for range improvements, selection of knowledgeable personnel, and other routine management decisions.
1934	Taylor Grazing Act	Controlled (fenced) grazing allotments created; no more free range.
1910	Western grazing lands totally stocked	Overgrazing prevalent.
1905	Forest Service created	Limits placed on number of cattle grazed on public lands.
1900	Floods!	"When the rain did finally come it fell in torrents, and there was no grass to slow the runoff nor hold it long enough for the water to sink into the ground. The resulting rushing water stripped the topsoil from the land" (Peplow 1958).
1890	Rapid increase in stock grazing	Mass migration of settlers to Southwest; increased herds, free range, and overgrazing.
1874	Mormon settlement	New population centers created; increased population and ranching and agricultural activity.
1871	General Crook subdues Indians	Provided for the relative safety of ranchers.
1870–1860	First attempts at grazing by white ranchers	Cattle stolen and ranchers killed or driven off by Indians.
1811–1751	Mission period—stock ranching reaches zenith	Increases in number of cattle in North America; many feral cattle due to Indian activity.
1521	First cattle brought to Mexico	Nonindigenous animal species introduced into Southwest.
1515	First horses brought to continent	Nonindigenous animal species introduced onto continent.

Table 2. The Number of Cattle in Arizona, 1918 & 1991

County	1918	1991	Change
Santa Cruz	50,000	17,000	33,000
Cochise	191,000	63,000	128,000
Greenlee	58,000	13,000	45,000
Graham	129,900	40,000	89,900
Gila	126,400	32,000	94,400
Yavapai	179,000	60,000	119,000
Apache	62,500	55,000	7,500
Pinal	89,000	162,000 ¹	(73,000)
PIMA	167,000	40,000	127,000
Cocconino	143,500	50,000	93,500
Maricopa	97,860	158,000 ¹	(60,140)
Navajo	79,000	45,000	34,000
Mohave	123,000	20,000	105,251
Yuma	15,332	85,000 ^{1,2}	(69,668)
Totals	1,511,492	840,000	671,492

¹ Increase in numbers probably a reflection of increased feedlot and dairy cattle.

² Includes La Paz County at 2000 head in 1991.

has decreased over the last 75 years. The USDA (1991) reports the current number of sheep at 262,000, and goats at 108,000. Other than a 21 percent increase in the total number of horses, there has been a reduction in the number of grazing and browsing animals (85% fewer sheep and 74% fewer goats) in the state. Changes in rangeland policy, coupled with increased environmental awareness on the part of cattle growers, have aided in reducing the number of animals foraging on Arizona's rangelands over the past 95 years.

Conclusions and Discussion

No one can exactly pinpoint the cause of changes in the watersheds and rangelands of modern Arizona. Obviously, man's activities can exacerbate and possibly accelerate such changes. However, changes may occur over time as a result of natural phenomena without the presence of man's activities. Attempts to predict what conditions might be like today without man's intervention, or to predict what conditions might have prevailed prior to man's arrival, are speculative, at best.

Early researchers cited overgrazing of rangelands as the primary cause of vegetation change and channelization. A series of floods in the late 1880s and early 1900s initiated channel entrenchment. It is now believed that both land use and climate change contributed to vegetative change and channelization. Other physical changes (changes in climate, earthquakes, etc.) may also have had an impact on historic range conditions.

The Arizona climate—southern Arizona in particular—is teleconnected to the equatorial Pacific and influenced by the El Niño Southern Oscillation. Regional changes in the seasonality and intensity of rainfall in southern Arizona are recorded in many studies. Speculation that the early years of this century have been the wettest in the last 450 years coincides with channel entrenchment and vegetative change throughout southern Arizona.

A large earthquake epicentered at Batepito in Sonora, Mexico, on May 3, 1887, disrupted the water table in many areas of southern Arizona and preconditioned channel systems for rapid flood-induced entrenchment. This earthquake had documented hydrologic effects and subsequent rangeland effects, including changes in water table elevations and streamflow discharges, and the development of fissured zones. Associated gradient changes encouraged channel backcutting and drainage of groundwater, thereby converting what were once perennial streams to intermittent and ephemeral conditions. This lowering of the groundwater table also caused the disappearance of grasses and encouraged domination of the rangeland by woody plant species.

In 1940, John Culley addressed the deterioration of the western rangelands in *Cattle, Horses and Men of the Western Range*, as follows:

There has been a vast ideal of publicity given by the press and magazines of the country during the last few years to the wide destruction of our western ranges. Government departments too have dealt exhaustively and sometimes spectacularly with the subject. And the burden of blame seems to have fallen on the cattlemen. But most of what has been written has been the work of professional journalists without any first hand knowledge of what they were writing about, or else the rather aloof comment of the scientific investigator.

There is no question but the range was disastrously overstocked. Nevertheless not too much blame should be laid on the cowman for this condition. In the first place the system of open range and community grazing which prevailed afforded him little opportunity for estimating the capacity of range pasture . . . [The] depletion of the range has proceeded by fits and starts. It is generally ascribed to overloading on the part of the stockmen. Yet there are instances in which the evidence is shaky, to say the least.

Culley (1940) goes on to tell of the invasion of foreign weeds and breaking up of range sod by "grangers" (farmers) as having dire effects on the

rangeland — *"And they've broken up the grama, and our lives, our hearts."*

Changes in rangeland policy, coupled with increased environmental awareness on the part of cattle growers, have aided in reducing the number of animals foraging on Arizona's rangelands over the past 95 years. Beginning in 1905 with the creation of the Forest Service, and continuing through the present, there have been institutional, legislative, and economic pressures brought upon the cattle industry to reduce carrying capacities.

In recent decades, environmental concerns have spawned legislation and policy changes within federal and state resource management agencies that have greatly affected the ranching industry. Numerous cattle operations have been pushed to the brink, and beyond, economically. Additionally, realization on the part of some ranchers in the West of the necessity for environmental protection and enhancement has further jeopardized their ability to garner a return on their investment after adopting newer rangeland and water management strategies.

There is a critical need for the development of alternative industries, both internal and external to the ranching industry, that could lend diversification to ranching operations. The goal is to create alternative sources of income, allowing ranchers to attain economic viability while maintaining their stewardship role on the land. Through such mech-

anisms, improvement of watershed and rangeland conditions within riparian corridors, as well as on upland areas, can be effected without the necessity to drive ranchers and livestock off public land. This is an area that should be looked into further by a diversified cross-section of the business and resource management industries in consort with the cattle growers' associations and the ranchers individually.

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