NPS Form 10-900-b
(March 1992)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
MULTIPLE PROPERTY DOCUMENTATION FORM

This form is used for documenting multiple property groups relating to one or several historic contexts. See instructions in How to Complete the Multiple Property Documentation Form (National Register Bulletin 16B). Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items.

_____ New Submission ___X_____ Amended Submission

A. Name of Multiple Property Listing

Arizona Cattle Ranching in the Modern Era, 1945-1970

B. Associated Historic Contexts

(Name each associated historic context, identifying theme, geographical area, and chronological period for each.)

Cattle Ranching in Arizona, 1540-1950

C. Form Prepared by

name/title William S. Collins, Ph.D.
street & number 1300 W. Washington telephone (602) 542-7159
city or town Phoenix state AZ zip code 85007

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. (__ See continuation sheet for additional comments.)

_____ _____
Signature and title of certifying official Date

_____
State or Federal agency and bureau

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

_____ _____
Signature of the Keeper Date

==========

Table of Contents for Written Narrative

==========

Cite the letter and the title before each section of the narrative. Assign page numbers according to the instructions for continuation sheets in How to Complete the Multiple Property Documentation Form (National Register Bulletin 16B). Fill in page numbers for each section in the space below.

==========

E. Statement of Historic Contexts (Document historic contexts on one or more continuation sheets. If more than one historic context is documented, present them in sequential order.)

==========

See continuation sheets.

==========

F. Associated Property Types (Provide description, significance, and registration requirements on one or more continuation sheets.)

==========

See continuation sheets

==========

G. Geographical Data

==========

Acreage of Property _____

UTM References (Place additional UTM references on a continuation sheet)

Zone	Easting	Northing	Zone	Easting	Northing
1	___	_____	_____	3	__	_____	_____
2	___	_____	_____	4	__	_____	_____

_____ See continuation sheet.

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)

Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

==========

H. Summary of Identification and Evaluation Methods (Discuss the methods used in developing the multiple property listing on one or more continuation sheets.)

==========

See continuation sheets

==========

I. Major Bibliographical References (List major written works and primary location of additional documentation: State Historic Preservation Office, other State agency, Federal agency, local government, university, or other, specifying repository.)

==========

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS)

_____ preliminary determination of individual listing (36 CFR 67) has been requested.
_____ previously listed in the National Register
_____ previously determined eligible by the National Register
_____ designated a National Historic Landmark
_____ recorded by Historic American Buildings Survey # _____
_____ recorded by Historic American Engineering Record # _____

Primary Location of Additional Data:

__X__ State Historic Preservation Office
__X__ Other State agency
_____ Federal agency
_____ Local government
_____ University
_____ Other

Name of repository____Arizona State Department of Library, Archives, and Public Records

==========

ARIZONA CATTLE RANCHING IN THE MODERN ERA, 1945-1970

Purpose and Organization

This document is an amendment to the *Cattle Ranching in Arizona, 1540-1950* Multiple Property Documentation Form (MPDF) covering the transitional era of the beef cattle ranching industry in Arizona after the Second World War. The major themes and facts described in that earlier document will not be repeated here and readers are encouraged to review it for information on the broad patterns of historical cattle ranching in Arizona's Spanish Colonial, Mexican, American Pioneer, and Early Modern eras. The purpose of this amendment is to provide technical guidance that historic preservationists, government officials, private property owners, and others may use to evaluate surviving examples of modern-era cattle ranches for eligibility to the National Register of Historic Places.

Section E provides a concise history of modern cattle ranching in Arizona, placing it within the national context of the meat-producing industry during the twentieth century, while identifying the unique attributes of the business as it has endured in Arizona's peculiar environment. Section F updates the description of property types associated with cattle ranching and provides additional guidance on identifying the important elements of historic ranching properties that may make them eligible for the National Register.

The context statement formally covers the period of twenty-five years from 1945 to 1970. The beginning date slightly overlaps the earlier document so that certain issues not adequately addressed there may be taken into consideration. The end date of 1970 is convenient because the 1970s saw a number of important changes in the beef cattle industry, thereby making it a reasonable stopping point. The narrative will occasionally draw upon facts and stories from years prior to 1945 where necessary to make events and trends in the modern era more understandable, and where those facts are not adequately covered in the original MPDF. Likewise, the narrative will sometimes continue beyond 1970 when necessary to fully describe certain historic trends. In particular, the first two parts of Section E will describe the major economic trends in American agriculture and the pattern of government legislation and policy affecting agriculture in order to place the details of the 1945-1970 period in context.

Following these brief economic and legal overviews, the primary narrative will focus on cattle ranching as a significant economic sector in the Arizona economy. Because the number of cattle operations, currently and cumulatively throughout Arizona history total many thousands, it will not be possible to approach the history of cattle ranching by studying the stories of a great number of individual ranches. In much of what follows, individual endeavors and peculiarities will be obscured by a methodology emphasizing the aggregate character of the Arizona beef cattle sector. Particular ranches will be mentioned to emphasize certain points, but the selection of these examples is based on what has been readily found in source

documents. Readers are therefore cautioned that the mention of a particular ranch does not imply that that ranch has historic significance of a level meeting the criteria of the National Register of Historic Places.

Major Economic Trends in American Agriculture in the Twentieth Century

The twenty-five year period covered by this MPDF, from 1945 to 1970, saw remarkable changes in the character of American agriculture. Among these was an increase in the rate of productivity unprecedented in history of farming and ranching. At the same time, the social character of farm organization and its contribution to American society shifted as the proportion of the population engaged in farming fell to less than two percent of the total. Prior to this era, sharecropping in the South and homesteading in the West had been important factors in the organization and spread of cultivated land. The period ended in a time of pessimism from the 1970s through the early 1980s during which concerns over rising energy costs and the seeming bankruptcy of traditional family farming became political priorities. These worries faded in subsequent years as prosperity in the agricultural sector returned and the long-term productivity trend was restored. This section provides a brief overview of the major economic trends affecting American agriculture during the whole of the twentieth century. This background information will reveal how important events and trends in the cattle industry in the period 1945-1970 fit into the larger pattern of agricultural history.

The twentieth century has often been referred to as “the American Century” because of the economic, political, and military dominance the U.S. attained, especially after the major European nations were devastated by two major wars. The continuing strength of American agriculture has been an important factor in this long-term dominance. Agricultural productivity has not only kept pace with the growth of population, it has allowed the U.S. to remain a net exporter of most agricultural commodities excepting those that do not thrive in its range of latitudes. This growth in productivity owes largely to continuing improvements in technology. At the beginning of the century, animals and human farm workers provided the bulk of farm and ranch power. These were replaced over years by machinery such as the tractor and a wide variety of specialized planting and harvesting equipment. In the animal sectors, improvements included artificial insemination, controlled feeding, cross-breeding, sanitation, and disease control. New types of crops such as hybrid corn and wilt-resistant alfalfa, combined with improved insect-control methods, magnified the productivity of crops for both human and livestock consumption. Innovations particularly affecting dairying and livestock feeding included milking machines, fans for ventilation and hay drying, barn cleaning equipment, silo unloaders, feed-handing equipment, and electric fencing. Added to these were the adoption

of cars and trucks and the general spread of electrical services, telephones, radio and television, all of which improved productivity.[1]

Improved technology shifted agriculture from a relatively labor-intensive field to a capital-intensive one. The 1910 U.S. census recorded a farm population of over 32 million persons, a historic peak. By 1990 this had declined to slightly more than 4.5 million. This decline in the agricultural population greatly accelerated during the 1940s as wartime and early post-war industrial demand drew workers from the fields. The farm population dropped from approximately 30.5 million in 1940 to less than 10 million in 1970. It has been theorized that labor shortages during the 1940s induced farm managers to substitute machinery for relatively expensive workers. During the 1950s, the trend continued, but it was more the result on continuing adoption of new technology 'pushing' workers out of agriculture than expanding industry 'pulling' them away.[2]
At the same time that the farm population was rapidly declining, the number of farms in the U.S. also declined, although at a slower rate. This was also largely a post-war phenomenon. The approximately 6.5 million farms recorded in the 1920 census was the historic peak, which declined to 6.1 million in 1940. Thereafter, the fall in farm numbers accelerated so that by 1970 there were less than 3 million farms. This trend continued in subsequent years, but at a slower rate so that there were about 2.1 million farms counted in the 1990 census.[3]

Another important change in the structure of American agriculture has been the trend towards larger farm size. As with other changes noted, this trend became apparent by the late 1930s, but became strongest in the immediate post-war decades. Between 1910 and 1990, the average farm size had increased from approximately 140 acres to about 460 acres. After 1990, the size of farms became more stable. At the same time, farmers have become more specialized. In 1900, about 4.73 million farms raised cattle; in 1992, only 1.07 million did so.[4]

Two other notable changes in American agriculture have aroused public concern. One is the fear that America's farm land is rapidly disappearing due to urban sprawl. Looked at over the course of the whole century, this shift in land usage is not apparent. Federal census figures calculated that in 1910, the U.S. had about 880 million acres in farms and 310 million acres of cropland. By 1997, this had *increased* to 932 million farm acres and 338 million acres in crops, with an additional 56 million acres idled, mostly under government programs. However, from its peak in 1950, when the census recorded over 1.2 billion acres in

[1] Bruce L. Gardner, *American Agriculture in the Twentieth Century: How It Flourished and What It Cost*, (Cambridge, Mass.: Harvard University Press, 2002): 8-47.
[2] Ibid., 98, 18-19. This push-pull hypothesis had/has potentially important ramifications on the issues of immigration.
[3] Ibid., 50-52, 98.
[4] Ibid., 58, 61.

farms, the 1997 figure represents a decline by almost 25 percent. Still, while development has converted millions of acres from agriculture to urban uses, it has not, in fact, seriously threatened the country's agricultural production as improved technology has more than made up for acreage converted.[5]

The second concern was over the perceived decline of the family farm. Jeffersonian political philosophy emphasized the importance of independent farm families as the foundation of a successful republican government. The plummeting proportion of the population on farms was one source of concern over the future of a now urbanized America. Another was the fear that corporate entities were replacing families as the primary operators of America's farms. More than the concern over loss of farmland, statistics demonstrate that worries over the fall of the family farm have been exaggerated. The 1997 agricultural census found that traditional family forms of ownership still accounted for 86 percent of U.S. farms, with an additional 12.9 percent under the ownership of partnerships or family-held corporations. Non-family-held corporations owned only 0.4 percent of U.S. farms, although these farms accounted for a disproportionate 5.6 percent of commodity sales.[6]

Since 1940, U.S. agriculture has enjoyed a rate of productivity gain per person employed of approximately 2.8 percent. This rate has not been entirely steady. Productivity gains were notably rapid from the late 1930s through the mid-1950s, then slightly below that rate from the mid-1950s through the mid-1960s. Still, the rate of productivity growth over the last seventy years has been far above the estimated annual rate of only one percent that has been calculated for the decades prior to 1940. Almost the same comparison can be made in output per acre, which was fairly constant during the first third of the century and began about 1935 to increase at a fairly stable 2.1 percent rate for the remainder of the century. No single factor seems to account for the continuity of these rapid growth rates, although the application of new technology appears to be the dominant factor. Other factors include government programs, changes in organization, the weeding out of less efficient producers, and the spread of education. These factors have affected all areas of agriculture. Later sections of this MPDF will describe the particulars of many of these changes as they affected the cattle industry in Arizona.[7]

[5] Ibid., 53, 270. A portion of the increase in farm and cropland occurred as a result of federal reclamation projects, which totaled 55.1 million acres in 1997 [Gardner, 179].

[6] Ibid., 56-57. Legislation and policies at the federal and state levels tend to favor family ownership, with some states banning corporate ownership of farmland. Large food manufacturing corporations have to a large degree avoided direct ownership of their sources of supply. In the case of poultry, for example, food processors have attained a large degree of vertical integration by instituting a system of contracting between themselves and independent poultry raisers. In 1993, about 89 percent of poultry farms operated under contracts, compared with less than two percent of cattle raisers. [Gardner, 68-71, 195-96]

[7] Ibid., 5-7.

==========

Agricultural Legislation and Policies in the Twentieth Century

Stockmen entered the post-Second World War era under the regimen of federal price regulations from which they were eager to be free. Government involvement in agriculture, however, long preceded the strict wartime controls. In decades prior, and especially during the New Deal era of the 1930s, the federal government had become deeply involved in the agricultural economy through a complex system of price and income supports, soil conservation programs, credit institutions, tariffs, education, and taxes. This engagement between government and private sector continued to evolve throughout the postwar era. Western cattlemen in particular were divided in their emotional preference for free enterprise and their traditional individualistic mode of operation and their desire for assistance during times of low prices, rising imports, and outbreaks of livestock diseases. Livestock journals such as *The Arizona Stockman* published almost side by side commentary disparaging the apparent slide of the U.S. towards socialism with calls for tariff protection against imported beef or federal action against cattle diseases. The reality was that the U.S. had long since abandoned the *laissez faire* operation of the market in agriculture in favor of policies designed to promote a number of goals, including parity prices, parity income, reduced production, increased productivity, efficiency, and the economic solvency of the family farm. Many of these policies were contradictory on their face, but none of them were imposed upon the agricultural sector entirely against its will. Indeed, the beef cattle industry had lobbied certain exemptions from New Deal era legislation that would come back to haunt it in succeeding decades. It is true, though, that western stockmen were the most reluctant of any agricultural producers to accept the expansion of federal programs. Whether this made any difference in regards to the long-term result of the larger trends affecting the entire agricultural sector is doubtful. As with all commodity producers, the size of ranches tended to increase over time as did their capital requirements, while at the same time their number decreased. Mechanization replaced labor-intensive methods and vertical integration reduced the individual farmer/rancher's scope for independent operation.

Federal land policies embodied in such legislation as the Homestead Act of 1862, the Desert Land Act of 1877, the Grazing Homestead Act of 1916, and the Taylor Grazing Act of 1934 had profound influence on the development of cattle ranching in Arizona in the late nineteenth and early twentieth century. The influence of evolving federal policies regarding the public domain has been considered in the earlier *Cattle Ranching in Arizona, 1540-1950* MPDF, and will not be repeated in this document. One piece of land policy legislation passed after the Second World War was the Multiple Use Sustained Yield Act (1960) that replaced the previous emphasis on the production of timber from National Forests with a more balanced production taking into account livestock, watersheds, wildlife management, and recreation. Cattlemen enthusiastically supported the concept of multiple use as it explicitly included stock raising as a primary use

for federal lands. They gave more tepid support if not outright opposition to the Wilderness Act of 1964. This act allowed reclassification of certain federal land as wilderness areas where, although cattle were not necessarily excluded, grazing activities would be increasingly restricted. In addition to land policy, other federal laws and programs have influenced the development of the meat industry nationally and cattle raising in Arizona specifically. One area of influence involved federal support for agricultural education and research. Congress passed the Morrill Act in 1862, the same year as the first Homestead Act, to establish a system of land-grant colleges, funded by large areas of public domain transferred to the states to sell or lease to pay for the construction of educational facilities. Once established, these land-grant colleges became convenient centers through which the federal government could expand its influence over the agricultural economy. The Hatch Act of 1887 added research to the mission of agricultural colleges. Additional federal support to schools to provide vocational, agricultural, and home economics education came with the Smith-Hughes Act in 1917. The Food Production Act (1917), passed as a war measure, extended the USDA's educational programs by mandating the placement of farm and home demonstration agents in every agricultural county in the country.[8]

Landmark health and safety regulations were enacted in 1906 through the Pure Food and Drug Act and the Meat Inspection Act. The pace of agricultural legislation accelerated during the Wilson Administration, first as a further development of Progressive Era ideas for improved efficiency and safety and later as war measures after the U.S. entry into the First World War. Important legislation included the Cotton Futures Act (1914), which standardized grading and attempted to restrict market speculation, and the Grain Standards Act (1916), which extended grading by federally licensed inspectors to grain commodities. These two acts built upon the precedent in the Meat Inspection Act to extend federal intervention in all phases of agriculture. Such acts promoted standardization of product types so that commodities brokers and consumers had less need to inspect each shipment of meat, corn or other produce, and could rely upon a system of presorting and packaging to know what they were purchasing. This evolution in marketing was furthered by the Warehouse Act of 1916 that established USDA-regulated warehouses where farmers could store crops such as cotton and receive receipts that they could use as collateral for bank loans. As a result of the war and the imperative to maximize the production and shipping of foodstuffs to America's European allies, Congress approved unprecedented federal controls over agriculture. The Food Control Act of 1917 gave Herbert Hoover's U.S. Food Administration control over prices of the major commodities. While the Food Administration did not provide direct price support to encourage beef production, its mandated low

[8] *Arizona Cattlelog* [referred to subsequently as *AC*], February 1963, 6-7; R. Douglas Hunt, *Problems of Plenty: The American Farmer in the Twentieth Century*, (Chicago: Ivan R. Dee, 2002): 34, 36.

price of corn had the same effect. By the end of the war, the number of U.S. cattle had increased by approximately twenty percent.[9]

The severe downturn in the agricultural economy in 1921-22 prompted political pressure from farmers on Congress and the Harding Administration to pass additional supportive legislation despite the Republican's otherwise hostile attitude towards federal involvement in the economy. Meatpackers and commodity speculators fell under attack through the Packers and Stockyards Act of 1921. Banks and cooperatives supporting the marketing of livestock received emergency credit through the Agricultural Credits Act (1921). Additional regulation of prices and the futures market were enacted in the Grain Futures Trading Act of 1922. The Capper-Volstead Cooperative Marketing Act of 1922 allowed agricultural cooperatives to work together free from barriers imposed by the Clayton Anti-Trust Act. The Intermediate Agricultural Credits Act (1923) created twelve intermediate credit banks under the Federal Farm Loan Board to loan funds to agricultural marketing associations and authorized the incorporation of private farm credit institutions to provide agricultural and livestock loans. Immediately prior to the Great Depression, President Hoover supported the Agricultural Marketing Act of 1929 that established a $500 million revolving fund for loans to agricultural cooperatives. The Federal Farm Board, also created by this act, quickly exhausted its resources as the depression took hold in 1930-31.[10]

The voluminous agricultural legislation that Congress enacted during the New Deal (1933-1941) built on the precedents of earlier legislation, expanding federal intervention into the credit market, export and import regulations, soil conservation, production control, and price and income support. The scale of New Deal legislation made it appear revolutionary in its effects, but the country had already taken the critical first steps towards adoption of a controlled agricultural economy many years before. The first major piece of legislation signed by President Roosevelt was the Agricultural Adjustment Act of 1933. This act attempted to remedy the problem of sinking commodity prices by eliminating the vast surpluses that were perceived to be their cause. The plowing under of growing cotton fields and the slaughter of piglets became the symbol of federal intervention in agriculture under the AAA. This act notably excluded beef cattle from its system of mass purchases and price support, the stockmen of the West being among the agriculturalists most opposed to the increasing federal role in their industry. Their reluctance to participate in the AAA did not, however, hinder them from accepting assistance from another program. Under the guise of food relief, the

[9] Douglas R. Hunt, *Problems of Plenty: The American Farmer in the Twentieth Century*, (Chicago: Ivan R. Dee, 2002): 28, 36-8. These federal laws built upon nineteenth-century developments like those of the Chicago Board of Trade that introduced the concepts of grain categories, which greatly facilitated production and marketing through such innovations as the futures market. Interested readers may reference William Cronon's *Natures Metropolis: Chicago and the Great West* (New York: W.W. Norton, 1991).
[10] Ibid., 55-56, 61-62.

American National Livestock Association supported "prompt action by the government" to purchase millions of surplus cattle. Begun by the Federal Emergency Relief Administration, such purchases of cattle continued through the 1930s under the Drought Relief Service. The emphasis of federal support, though not its goals, changed after the Supreme Court struck down the AAA in 1936. To replace it, Congress immediately passed the Soil Conservation and Domestic Allotment Act and in 1938 passed the second Agricultural Adjustment Act. Rather than seek restoration of parity prices, the new goal of these programs was to restore parity farm income, which attempted to support the incomes of farm families more directly. This was in part a reaction against the earlier crop reduction programs that yielded greater subsidies to the largest land owners and thus was perceived as working against family farms. For decades to come, the expense of federal agricultural policies was magnified by the dual pursuit of contradictory goals: efficient and profitable production, which was associated with large, capital-intensive agribusiness; and the traditional family farm, an institution thought by agricultural experts to be inefficient, but intimately connected to traditional American ideals.[11]

Other New Deal era creations included the Commodity Credit Corporation (the New Deal's other CCC), which provided credit on the collateral of farm produce, produce that was often forfeited to the government when the loan could not be repaid. The Farm Credit Act reorganized the growing number of agricultural credit agencies under the Farm Credit Administration, which with the CCC became the primary lenders for farmers during the Depression. Another New Deal agency that would eventually have great effect on the farm and ranch economy was the Rural Electrification Administration. This agency, created in 1935, spread electricity services to rural areas where private utilities had previously refused service. This allowed for the later adoption of new technology that transformed the production of livestock as well as improving the living conditions of stockmen and their families.

The primary wartime economic legislation was the Emergency Price Control Act of 1942 that provided for minimum prices to encourage maximum production. The result of wartime demand and a guaranteed market was a surge in farm income to its highest level since the previous war. Net farm income increased from $4.4 billion in 1940 to $12.3 billion in 1945. Western stockmen for the most part welcomed the end of wartime controls and opposed further expansion of federal intervention in agriculture. They were fairly successful in opposing new federal programs even while producers of other commodities showed less hesitancy in accepting federal largess. Still, stockmen continued to support purchase programs such as the Agricultural Trade Development and Assistance Act of 1954 that used commodities such as beef for foreign aid. Although the Eisenhower Administration, especially Secretary of Agriculture Ezra Taft Benson did

[11] Ibid., 69, 77-8, 80-84, 88.

their best to prevent passage of New Deal-style legislation, the bipartisan farm bloc in Congress could not be entirely forestalled without alienating the critical rural vote, a factor that had played a crucial role in the defeat of Republican presidential candidate Thomas Dewey in 1948. The Administration therefore supported the Agricultural Act of 1956 that introduced the short-lived Soil Bank program, which paid farmers to take land out of production for long periods of time. One reason why stockmen opposed such programs was that they would have to pay higher prices for feed products if the prices of other commodities rose. Equally ineffective, although expensive, was the Family Income Act of 1960 that attempted to provide an additional prop to the failing institution of the family farm.[12]

Recent federal policy has not departed significantly from the earlier pattern of growing federal support for agriculture. Indeed, the Agricultural Adjustment Act of 1938 continues in force despite numerous attempts to swing federal policy in new directions. During the 1970s, agriculture became a victim of larger economic priorities, first in 1973 when President Ford imposed an export ban on soybeans and cottonseed to reduce the cost of feed to livestock producers and imposed a price freeze on beef in order to bring inflation under control. In 1980, despite an earlier pledge to never impose an agricultural embargo, President Carter did just that in response to the Soviet Union's invasion of Afghanistan. The Arab oil embargo of 1973 during the Arab-Israeli War contributed to a price squeeze that reduced net farm income from $34.3 billion in 1973 to $25.5 billion in 1975. Ranchers were increasingly forced to heed the advice circulated by experts to "get bigger, get better, or get out." Another milestone federal action during 1973 was the ban by the Food and Drug Administration of the growth hormone diethylstilbestrol (DES) as a feed additive for beef cattle. This order came in response to research indicating a connection between the hormone and cancer. It also was an important early response to the new scientific order of business that would increasingly characterize stock raising in the emerging era of biotech. The resilience of federal agricultural subsidies was proved, even after a free market reform-motivated Republican Congress took advantage of then relatively high crop prices in 1996 to pass the Federal Agriculture Improvement and Reform Act, also known as the Freedom to Farm Act. This act laid out a path for eventually ending federal payments to farmers while immediately lifting previous crop restrictions. Lower prices followed inevitably upon the great increase in output this law encouraged. Farmers gambled that when the time came, the federal government would not cut them off from support. They were entirely correct in their prediction as later Congresses ignored the previous resolution to wean agriculture from subsidies and appropriated billions of additional dollars in support.[13]

[12] Ibid., 99, 113, 116-9.
[13] Ibid., 133-4, 139, 141, 147-48, 152-53.

==========

The National Market Structure in the Meat Industry, 1945-1980

Cattle ranching in Arizona is fully integrated with the national, and even international, meat industry. Colorful real-life personalities and the romantic image of cowboy culture marketed through print and film masked the integrated industrial aspect of the business behind a façade of rugged individualism and regional exceptionalism. The reality is that cattle raising in Arizona, apart from the occasional hobby ranch of a well-to-do cowboy aficionado, is a business enterprise conducted by its owners and managers to produce a profit, or at least a living wage. (This statement has to be modified when one encounters the historical phenomenon of ranches operated not necessary for profit but as tax shelters for wealthy investors.) Investment capital, sources of cattle and feed supply, government regulations, veterinary methods, herd breeding, land management rules and practices, the location of consumers as well as their shifting preferences, market prices, retailer demands, and the critical role of the meat packers are national factors that determine the broad pattern of the red meat industry. Local factors affecting the character of Arizona cattle ranching include terrain, climate, the importance of public lands, and its location between the ranching heartland of Texas and the southern Plains and the urban market of the West Coast. This section provides a brief overview of the national beef industry as it evolved in the decades following the end of World War II, providing a context to assist in evaluating the Arizona experience.

The meat industry is one of the largest agricultural sectors in the American economy. The industry is multifaceted, and includes several types of meat, which cannot be given full justice in this brief overview. While beef was the largest sector of the meat industry during this period, it competed with pork products, a close second in output. In recent years poultry became increasingly competitive and finally surpassed beef in the American diet. By the close of the Second World War, its major characteristics had already been established. Production centered primarily in the diversified farms of the Midwest, despite the fame of the western cattle ranch and the political pull of the American National Cattlemen's Association. The problem of transportation had been resolved by the invention of refrigerated rail cars and trucks. Meatpacking was a factory-oriented process dominated by large national firms such as Armour, Swift, Cudahy, and Wilson & Co. Retailing was increasingly handled by chain grocery stores who favored prepared meat cuts over skilled butchering. The concentration of cattle processing plants in locations such as Chicago facilitated the organization of labor, which had also been eased by the relatively pro-labor policies of the Roosevelt Administration (1933-1945). Government regulation emerged during the Progressive Era in the form of antitrust efforts and health regulations. Finally, Americans were traditionally meat-favoring consumers who from the late 1940s through 1960s increased their per capita meat consumption as reflection of their larger economic prosperity.

The industry, however, was anything but stable. In every segment of the market from production to consumption new forces were emerging that fundamentally altered the business structure and its practices. Many of these changes reflected a relentless drive to lower costs at every stage. Newly available technology and the subsequent need to replace existing processing plants, along with the desire to escape the burden of union labor, for example, led to the abandonment of Chicago by the meatpackers who relocated to the lower-cost rural Midwest, Southwest, and Far West. The dominance of the Big Four meatpackers was challenged after 1960 by the aggressive Iowa Beef Packers (IBP), whose modern capital-intensive facilities created and then dominated the boxed beef business, which increasingly replaced the previous practice of transporting semi-processed carcasses. Other innovative firms entered the business and challenged the market position of established businesses. About fifty packers dominated the national market with multi-plant facilities and branded products, although another fifty-one one-plant facilities were important in the eastern states. Corporate acquisitions, mergers, resales, and divestitures constantly changed the management and ownership behind the labels. Such corporate reorganizations and shifting capital investments greatly affected organized labor, already weakened through competing union organizations. Anti-union policies exacerbated a general reduction in employment resulting from modernization. The 274,000 workers employed by meatpackers in 1947 dropped to about 189,000 in 1972.[14]

American consumers had a strong demand for beef, but they were not willing to tolerate too much price gouging. In the initial post-war years, the aggregate demand for beef increased dramatically, reflecting the increasing size of both the American population and their per capita meat consumption. Department of Agriculture statistics indicated that in 1945 every American consumed on average 71.3 pounds of beef and veal, 66.6 pounds of pork, and 25.1 pounds of poultry. By 1976, beef consumption head reached a peak of 129.8 pounds per capita, with 61.5 pounds of pork, 39.9 pounds of poultry, and a mere 1.7 pounds of lamb. These per capita increases occurred in addition to the growth in U.S. population from about 132.5 million in 1945 to approximately 218 million thirty years later. Scandals in the beef industry and, more importantly, increasing concern over the healthfulness of beef, caused a dramatic reversal of the previous pattern beginning in the late 1970s. Beef consumption declined to only 78.2 pounds per person in 1983, pork remained relatively stable at 61.9 pounds, and lamb, mutton, and goat consumption increased slightly to 4.6 pounds. Poultry made the largest gain to 65.6 pounds per capita. This trend continued especially after

[14] Jimmy M. Skaggs, *Prime Cut: Livestock Raising and Meatpacking in the United States, 1607-1983*, (College Station: Texas A&M University Press, 1986): 190-95.

McDonald's 1983 introduction of the Chicken McNugget revolutionized the processing and marketing of chicken products. By 2001, Americans consumed 82 pounds of chicken per capita annually.[15]

The price of beef was affected by several factors after the lifting of wartime price controls. In the first place, American producers were protected by tariffs from cheaper imported beef, although the U.S. remained a net beef importer. The peak of protectionism occurred in 1930 with the Hawley-Smoot Tariff that placed a 20 percent tax on imported beef. Significant reductions in the tariff rate were accomplished in the 1940s and 1960s, down to five percent in 1964. In response, cattlemen demanded and convinced Congress to pass the Meat Import Act of 1964 (revised in 1979) that established quotas on the quantity of beef imports. Federal inspection and grading of beef in interstate commerce had been one of the major accomplishments of the Progressive Era. President Theodore Roosevelt in 1906 had signed the Pure Food and Drug Act and the Meat Inspection Act in the aftermath of the public outrage arising from the publication of Upton Sinclair's *The Jungle*, an expose of the unhealthful practices in the meatpacking industry. The laws required inspection and labeling of meat products and created quality classifications ranging from Prime to Choice, Good, and lower grades for other meat uses. Citing the supposed high cost of inspection fees, the packers convinced the government to end compulsory meat grading in 1946. Mandatory grading was temporarily reinstated during the Korean War, and ended again after 1953. Initially, about half of interstate beef dropped out of the grading process, but packers slowly decided that it was a valuable marketing tool and the rate began to rise, reaching about 96 percent in 1983. At the same time the packers achieved a grading inflation by convincing the federal government to upgrade Choice to Prime and Good to Choice. This served the interests of ranchers who grass fed their cattle since, without specialized feed, grass-fed cattle typically did not rise above the Good grade. Other changes at the behest of the industry occurred over the years, each time spurring outrage among consumers forced to pay higher prices for beef they perceived as lower quality.[16] On top of this grading inflation, investigative reporting in the 1970s revealed evidence of widespread bribery of inspectors and mislabeling of beef. Such adverse publicity contributed greatly to the rise in popularity of chicken, which was promoted as a healthful substitute for beef.[17]

Most cattle raisers were at the mercy of the marketplace. Unlike the meatpackers, small in total number and dominated by a few well-capitalized firms, the cattle raisers were numerous and had little power to

[15] Ibid., 166-67. Steve Striffler. *Chicken: The Dangerous Transformation of America's Favorite Food* (New Haven and London: Yale University Press, 2005): 18.
[16] The position of the beef industry was that refinements of grading reflected changes in the definition of what constituted 'quality.' The issue was between taste (the previous standard) and healthfulness (the increasingly important standard). Leaner beef with less marbling was by 1970 judged more healthful and so the federal standards eventually accepted it as appropriate within the higher grade categories.
[17] Skaggs, 171-72, 124, 168-69.

influence the prices they received. They could try to exert political pressure, as in the case of the American National Cattlemen's Association, a powerful proponent of protection from foreign imports. However, their primary means of adjusting to market conditions lie in controlling the number and quality of their herds, by adopting various best-practices, and finding other means to reduce their costs. Reducing costs or improving herds typically involved capital investment, which implied debt that exposed the rancher to potential financial disaster should the market move in an unexpected direction. At the same time, other cattle raisers were making similar cost-cutting efforts, which tended to drive down commodity prices to the benefit of the meatpackers and, ultimately, the consumers, with only marginal benefit to the producers themselves. Ranchers also could not respond immediately to increases in anticipated demand. Increasing herd size through reproduction required time and an ability to withhold cattle from the market. Ranchers could purchase cattle from other sources, but this also implied debt if undertaken too rapidly. Neither were they free of the effects of drought or freezing weather that could hinder the growth or even kill cattle in large numbers just as it had in the nineteenth century.

The price of cattle increased rapidly after the lifting of federal wartime controls in 1946 from $14.66 cwt (per hundredweight, i.e., per hundred pounds) to $23.29 at the end of 1947, and then to a post-war high of $29.69 cwt in 1951. Retail prices followed a similar explosion and consumers reacted by cutting down on their beef consumption, which declined to only 64 pounds per capita at the peak price. The high price of meat encouraged both an increase in supply and a decrease in consumer demand, and by the early 1950s, the bubble burst as the market became oversupplied, causing prices to fall. In 1956 they bottomed out at $14.90 cwt. Another, though less dramatic supply/price cycle soon followed. Increasing demand and relatively short supply drove average prices to $21.30 cwt in 1962, and then fell to a low of $17.22 by 1967, again as cattle raisers glutted the market. During the subsequent fifteen years the United States suffered from high inflation that drove the price of all good upwards, tripling the consumer price index and making comparisons of prices more difficult. The price of cattle reached an unprecedented $66.10 cwt in 1979, a watershed year in retrospect, when chicken would emerge as a powerful market competitor. It dropped slightly to $62.40 then continued along the upward spiral of general prices.

Another measure of prices common in agriculture is the parity price, which is an index of prices compared to the base years 1910-14. At the 1951-52 peak of the Korean War-era bubble, cattle raisers were receiving prices 46 percent above parity, a rate far higher than their crop-raising fellow agriculturalists. This fell steadily to 82 percent of parity in 1957, recovered slightly to 91 percent in 1973, and then fell as low as 54 percent in 1982. When compared with the 1967 price level, cattle raisers at the end of 1980 were receiving 165 percent higher prices, but in reality this was an inflationary mirage. The index of prices paid

by cattle raisers had increased 192 percent, meaning that cattle raisers in 1980 had an earnings-to-expenditure ratio of some 92 percent of what they had in 1967.[18] The combination of boom and bust cycles and the long-term trend towards lower relative prices meant severe challenges for cattle raisers. Continuing efforts to reduce costs would save some, but many ranchers would eventually fall out of the business.

Postwar Adjustments in Arizona's Ranch Economy, 1945-1952

It was once said that Arizona's economy rested on a base called the "Five Cs," representing Cattle, Cotton, Citrus, Copper and Climate (tourism). Agriculture continues as a major source of the state's income, with produce in 2005 valued at some $3,105,621,000. The top five products were, in descending order: cattle and calves ($773,700,000 or 24.9 percent), dairy ($555,621 or 17.9 percent), lettuce ($500,749,000 or 16.1 percent), cotton ($186,969 or 6 percent), and hay ($152,097,000 or 4.9 percent).[19] These figures indicate that while both cotton and citrus growing have become relatively marginal endeavors, cattle raising remains economically important. But while the value of cattle to the Arizona economy is large, the relative importance of Arizona to the national livestock industry is minimal. The U.S. inventory of cattle in the 2002 agricultural census was 95,497,994 head. Arizona contributed 841,277 head, making it 34th in the nation. Arizona's output in cattle and calves was only 1.6 percent of the total U.S. value in that sector, compared with Arizona lettuce, which accounted for 25.2 percent of the total U.S. value of that crop. The federal agricultural census indicates that the number of farms raising cattle and calves in Arizona declined from 3,721 in 1997 to 2,838 in 2002. This reflects the continuation of a long-term downward trend. Current data also indicates the relative importance of large ranching operations. In 2002, the 212 largest ranches (those with 500 or more head of cattle) had an inventory of 703,116 head, an increase in concentration since 1997 when the 298 largest ranches had an inventory of 642,845 head.[20]

Ranching in Arizona and the West differs from cattle raising in less arid states in its utilization of vast tracts of land. Ranches of a million acres or more have been known through the history of the West.[21] Typical ranches ranged in size, counting both owned and leased land, from several hundreds to tens of thousands of acres. Many large ranches in Texas, New Mexico, Arizona, and California had their foundations as extensive Spanish- and Mexican-era land grants, most of which soon changed out of the

[18] Ibid., 167-68, 78; Arizona Crop and Livestock Report Service, February 1981.
[19] State Fact Sheets: Arizona, USDA Economic Research Service, www.ers.usda.gov/StateFacts/AZ.htm.
[20] 2002 Census of Agriculture, Vol. 1, Chapter 2: U.S. State Level Data, U.S. Bureau of the Census, www.nass.usda.gov/census/census02/volume1/us/index2.htm.
[21] Skaggs, 173, 175, 62-63.

ownership of their original families after the American acquisition of the region. The San Rafael Ranch in the upper Santa Cruz River Valley of Santa Cruz County is an Arizona example. It is an error, however, to equate the large size of western cattle ranches with their overall contribution to the production of American beef. Through all eras in American history, relatively small farms have contributed the bulk of cattle production. Western states cattle raising, especially in Arizona where extensive areas are not merely arid but truly desert, occurs on land of the most marginal economic value. The estimates for the average market value of land and buildings in the 2002 agricultural census ranked Arizona 46th with an average value of only $398 per acre.

The Second World War did not disturb the fundamental trends in Arizona's cattle industry that had been apparent prior to the war. The dominant activity was the so-called cow and calf operation, in which the calf crop was the primary product for sale. A smaller and more speculative sector was the steer ranch, which operated by purchasing steers and, hopefully, profiting from their fattening in the few months before their resale. Since the 1910s and '20s, when reclamation projects along the Salt River had vastly expanded the scope of irrigated agriculture, Arizona's cattle business had increasingly focused on the specialized function of feeding and finishing[22] immediately prior to sale for slaughter. With a relatively small local market, Arizona served primarily as a way station between the productive regions of Texas, Oklahoma, Colorado, New Mexico, and Mexico and the urban consumers of California. In the ten years following the end of the war, the state's average cattle inventory of 902,000 head varied insignificantly from the average of 900,000 during the preceding twenty years and the state's standing remained fairly steady at about 34th among the states. The Arizona inventory accounted for approximately one percent of the U.S. total during these years. Arizona's standing in the niche sector of cattle on feed, on the other hand, rose from 21st in 1930 to 9th by 1960 and has remained more or less at that ranking ever since. As of January 1, 1930,[23] there were about 23,000 head on feed in commercial feedlots. This number rose steadily to a peak of 510,000 in 1976 then fell to an average of 311,000 between 1977 and 2005. Within the immediate postwar years, 1946 to 1953, the number of cattle on feed doubled from 50,000 to 102,000. This steady growth over the first two decades after the end of the Second World War was one of the few stable factors in the state's livestock sector. The war had merely introduced an interlude in which feeding focused on mature two- and three-year old cattle

[22] The distinction between feeding and finishing is one of duration. "Finishing" refers to a final burst of nutritious, fattening feed given to an animal just before slaughter. "Feeding" is a longer-term supplement or substitute for grass grazing intended to allow it to mature healthfully to maximum size. See Heather Smith Thomas, *Storey's Guide to Raising Beef Cattle*, (North Adams, Mass.: Storey Publishing, 1998) for an introduction to cattle terminology and details on breeding, handling, feeding, and other aspects of raising cattle.

[23] The January 1st statistic was generally the peak of the year. Cattle typically remained on feed for from 90 to 120 days.

that could be finished and sent to processing more quickly than calves, a temporary throwback to the practice of decades previous.[24]

Cattlemen expected both price and demand to increase after the lifting of wartime price controls. This did indeed occur and to such an extent that by 1948 consumers were complaining loudly about commercial retail beef prices. Despite an occasional dip, prices continued upward until 1949-50 when there was a general feeling that the national supply had caught up with demand and prices would, perhaps, gently fall. The outbreak of fighting in Korea in June 1950 led to another surge in prices to record high levels, despite the reinstitution of price stabilization regulations. Overall, the years 1946 to 1953 were among the most prosperous that cattle raisers would enjoy during the entire twentieth century. Not every rancher benefited equally from this prosperity. Lack of rainfall was probably the most important factor affecting the condition of public and private rangeland and during these years it was usually less than optimal. But with high commodity prices and relatively abundant credit, many ranchers took advantage of the opportunity to improve their production methods through capital investment.

As one of the largest sectors of the state's economy, banks and other financial institutions arose to provide the capital ranchers needed. The Valley National Bank (VNB), the largest in Arizona, had an active agricultural and livestock loan program. For over seven years, VNB's agricultural loan program was managed by Frank Armer, a leading soil and range authority. The First National Bank of Arizona also offered agricultural loans statewide under the oversight of P.O. "Pop" Peters. In addition to the general banking institutions, there were a number of smaller specialty financial institutions meeting the needs of farmers and ranchers. The Arizona Stockmens Loan Company of Flagstaff, founded by H.V. "Vic" Watson, served the ranchers of northern Arizona. After his death, the company was taken over in 1953 by an investment group comprised of many of the prominent ranchers of the region, including Ray Cowden, Norman Fain, John Jacobs, M.O. Best, R.C. Spurlock, and Clifford Clements. To manage the reorganized firm, they hired Armer away from VNB.[25] Another firm was the Arizona Livestock Production Credit Association which was founded in 1934 with a federal loan during the New Deal era by central Arizona

[24] *The Arizona Cattle Feeding Industry*, Technical Bulletin 191, Tucson: University of Arizona Agricultural Experiment Station, 1972, 1; Stanley, E. B., (1945) "Calves Popular Choice," *AC*, 1:3, 26. Stanley was Animal Husbandman at the university and also represented the Arizona Hereford Association.

[25] Armer was a native of Payson and graduate in 1933 from the University of Arizona (UA). After a year with the State Tax Commission, he worked for six years with the Soil Conservation Service, then in 1941, briefly with the Grazing Service, which gave him invaluable knowledge of soil and range conditions around the state. Service in the Army from 1941 to 1944 was followed by a brief stint as animal husbandman with UA. He was then hired by VNB in September 1945. He was an active rancher as owner of the "T" Cattle Company in southern Yavapai County and part-owner of the Spider Ranch west of Prescott and active as well in several cattlemen's organizations. ("New Stockholders And Officers Announced for "Vic" Watson Flagstaff Loan Interests," *Arizona Stockman* [subsequently referred to as *AS*], February 1953, 20-21.)

ranchers J.M. Cartwright, William R. Bourdon, Irving L. Gibson, T.J. Hudspeth, and George H. Wilbur. This credit association was successful and not long after the war had repaid its initial loan and was paying dividends to its members. Additional out of state investment funds were available from companies such as the Connecticut Mutual Life Insurance Company. An older firm was the Phoenix National Farm Loan Association, founded in 1917. Also in Phoenix was the Farmer's and Stockman's Bank, owned for many years by Phil Tovrea, Sr., who also owned the gigantic feed lots located between Phoenix and Tempe.[26]

In the late 1940s, ranching still retained a tenuous connection with its nineteenth century frontier prototype. *The Arizona Stockman*, a monthly magazine that since 1935 kept cattlemen as well as sheep and horse raisers informed about local and national developments, regularly reported the deaths of pioneers who had established the earliest ranches around the state. Increasingly, obituaries listed members of the second generation, children of the first pioneers who knew the primitive conditions of life before electricity, automobiles, reclamation engineering, and urban growth, but who had not witnessed directly the early days of conflict between their parent's generation and the Indian tribes. One of the last was Jackson Manford "Mannie" Cartwright who was brought to Arizona by his parents in the 1860s and who homesteaded in the Salt River Valley in 1874. He and his father were charter members of the Arizona Cattle Growers Association. Following his retirement in 1938, and the take over of the family operations by his son, Jack, Jr., Cartwright enjoyed the plaudits of his fellow stockmen well into the 1950s, receiving, for example, an award for his public services by the Swift Company in 1955.[27] But it was not long after mid-century that the pioneer era disappeared from living memory. Modernization, economic rationalization[28], and capital investment were the ideas in the forefront of ranchers planning for the future. The America of 1945 was looking to the future as a time of vigorous growth and development. It was soon apparent that there would be no return to the depressed economic conditions of the 1930s and that there would be no crash as had occurred in the aftermath of the First World War. The years from 1945 and 1953 were a time of confidence, but also of wariness. The wise rancher was the one who took the opportunity to invest in his business so that he would not be among those who fell out when the next economic shakeout did eventually occur.

[26] "Arizona Livestock Production Credit Association Holds 14th Annual Meeting, *AS*, March 1948, 45-46; "Phoenix National Farm Loan Assn. Growing," *AS*, October 1954, 25; Advertisement, *AS*, January 1955, 11; "Staley and Hawn Buy Stockman's Bank," *AS*, November 1954, 42. The sale referred to in the last reference was to Rex E. Staley, a former vice president of the First National Bank of Arizona, and R. Dean Hawn a banker from Dallas, Texas. At the time of the $1 million sale the bank had some $14 million in deposits and capital value of $600,000.
[27] "Swift Award Presented to Cartwright," *AS*, July 1955, 35.
[28] Rationalization is the continuous drive to improve control over the production process with the goal of reducing costs and increasing the value of output.

Windmill and water tank on a ranch near Mammoth, ca. 1950. Arizona State Library, Archives and Public Records, Archives Division, Phoenix #02-4558.

Both *The Arizona Stockman* and the *Arizona Cattlelog*, a journal first published by the Arizona Cattle Grower's Association in 1945, reported on model ranching operators and the latest innovations in breeding, feeding, and soil conservation. One highlighted operation was the Sopori Ranch, located near Amado in Santa Cruz County. Near the end of the war, a group of investors purchased the ranch, which encompassed 120 sections of land. Its managing partner, W.R. "Budd" Thurber, was a native Arizonan who had grown up on a ranch just to the east. The investors purchased a registered Hereford herd to upgrade the existing 1,000 head of cattle and invested in new, large stock buildings. While its vast extent might seem able to support innumerable cattle, in reality the herd's survival depended upon 750 acres under pump irrigation to raise

feed crops and alfalfa.[29] Large capital investment in equipment and stock of the type exemplified by the Sopori Ranch were to characterize successful ranching in the coming decades.

Business investment and industry rationalization took place at two levels. The first level was that of the individual ranch operation and included those activities that ranch owners could accomplish with their own resources. Such resources varied tremendously. At the low end of the economic scale were small, marginal ranches where relatively non-descript cattle grazed and reproduced providing some income for their owner-operators. These owners often relied on alternative sources of income and perhaps worked on nearby large ranches while they nursed hopes of building up their own operations. Seasonal or urban employment was often their chief income and cattle raising, in effect, more of a lifestyle. One might compare them with the affluent hobby ranches of well-to-do businessmen who developed small, first-rate cattle operations, but who never had to rely upon them for their financial security.

Eulalia Bourne (1892-1984) is an example of a smalltime rancher who from the 1930s to 1960s operated two small outfits along the San Pedro River. Bourne was born on a Texas homestead and raised in the White Mountains of New Mexico. She came to Arizona sometime between 1911 and 1914 and was married to William S. Bourne, whom she divorced in 1915. A number of men came and went through her life in succeeding years, although she never had children and more often than not had to make a living for herself. Sale of a few head of cattle a year, however, could not sustain her home and she supplemented her income by teaching the children of ranchers and ranch workers in rural schools. During her retirement, she wrote about both of these experiences in three notable memoirs, *Woman in Levi's* (1967), *Nine Months is a Year* (1968), and *Ranch Schoolteacher* (1974). In these works she recorded the daily work life of the small-scale rancher at mid-century, and of the children of ranch workers, mostly Hispanic, who struggled to obtain an education and make the best for their families from their limited resources.[30]

On the other end of the economic scale was Walter E. Holland who was the former vice president in charge of engineering and research at the Philco Radio Corporation of America, and who came to Arizona in the mid-1930s as a complete novice, interested in starting a ranch of his own. What he lacked in experience he more than made up for in financial resources with which he was able to obtain the services of Dr. E.L. Scott, then with the University of Arizona (UA) and an expert in Hereford cattle. In 1947, Holland moved his Rancho Sacatal operations to a 19,000-acre spread southeast of Willcox in the foothills of the Dos Cabezas Range. When his son Roy, a UA-educated agriculturalist, took over the ranch in the early

[29] Hellbusch, Cecil (1946) "Sopori Ranch," *AC*, 1:11, 8-10.
[30] Biographical information from "The Teacher: Eulalia "Sister" Bourne, 1892-1984," at www.cowpuncher.library.arizona.edu/teacher.htm.

1950s and was raising champion stock, the elder Holland could enjoy his sunset years in a successful and comfortable home on the range.[31]

The number of cattle ranches in Arizona was in the thousands. A small number of large ranches controlled vast areas of land, sometimes in multiple units across the state. In the period 1945 to 1953, family ownership of these and lesser operations remained dominant. Some were first generation entrepreneurs. Others were transitioning to the second generation, to sons or, many of whom had formal educations from agricultural colleges that their parents did not always have. There were also the corporate ventures, large in scope and well financed, such as Goodyear Farms, which had begun as a grower of long staple cotton in the 1920s and increasingly diversified their operations to include a livestock component.

For the most part, cattle production in Arizona remained a distinctive economic function from processing, the latter usually under the control of the West Coast meatpackers. Since the early 1920s, the largest meatpackers had been legally enjoined from extensive vertical integration and so did not directly control their sources of animals. They relied upon the literally millions of producers around the country who operated in a competitive market. Ranchers believed, and the federal government agreed, that these processors exercised undue control over the prices at which they bought from ranchers and sold to consumers. Prior to the war and in the few years immediately following, Arizona consumers also could purchase from a local meatpacker. The Tovreas, Edward and son Phil, operated a relatively integrated business that included finance, cattle raising, cattle feedlot operations, real estate management, and meatpacking. Phil Tovrea, however, chose to divest himself of some of these extensive operations, selling his meatpacking business to the Cudahy corporation shortly after the war and the Farmer's and Stockman's Bank in 1954.[32]

[31] "Rancho Sacatal a Typical Arizona Hereford Ranch," *AS* June 1954, 16-18. The father-son partnership between the Hollands dissolved in 1967, with Roy continuing on in the business with his own family, which then included sixteen-year-old Robin, who that same year won a trip to Chicago as a prize in a 4-H contest for her description of the various divisions of a beef carcass. Advertisement in *Arizona Cattlelog*, September 1967, 7; "Robin Holland Wins Trip to Chicago," *AC*, September 1967, 22.

[32] The Tovrea family business was started by Edward A. Tovrea, an Illinois native born in 1862, who had gained his first experience with cattle at the age of nine in Kansas. He went into freighting business at age 17 when he acquired a wagon and four-mule team, moving first to Colorado then to Arizona, where he hauled on the primitive road between Ash Fork and Jerome. After a brief adventure at the Grand Canyon prospecting for gold, he moved to the Salt River Valley and took up homestead land near Arlington, but his contract business with Los Angeles merchants failed in 1889. He then contracted to supply beef to construction crews building rock and brush dams on the Gila River and sometimes worked there himself. He returned to Jerome, this time as a butcher, and demonstrated a new level of entrepreneurship, constructing the town's water works and serving as mayor. Despite such success, he did not remain in Jerome, moving next to Bisbee and then in 1919 to Phoenix. Between then and his death in 1932, he built up a large and successful cattle business with ranches covering 750,000 acres from New Mexico to California, feedlots, and slaughtering facilities. Phillip, the youngest of five sons took over the business following his father's death. He had served in the Army during World War I and had gained experience in all phases of the cattle and meat business while living in Los Angeles in

Hereford bull, ca. 1950. Arizona State Library, Archives and Public Records, Archives Division, Phoenix #01-0167.

The major elements of cattle raising directly under the cattleman's control were the breed of animals, the number of employees, the type of feed, and the quantity and type of capital equipment such as buildings, tools, and machinery.[33] The question of breeding was important throughout the early postwar years because the market distinguished several grades of beef and priced cattle accordingly. The industry perceived a trend in consumer preference for higher quality beef at least from the Good to Choice categories and somewhat from Choice to Prime, and so cattle raisers were under some pressure to product higher quality

the 1920s. At mid-century, the Tovrea feedlots were reputed to be the largest in the world. (Richard Schaus, "Tovrea—60 Years of Cattle," *AS*, June 1948, 8-9, 14.)

[33] During the period 1945-1953, ranchers and public officials explored the possibility that the weather might be controllable and there were numerous experiments in rainmaking. These did not prove effective.

animals if they wanted to receive top prices. However, quality animals (quality was usually equated with larger and fatter animals) were more expensive because they required specialized feeding. Grass-fed cattle rarely rose above the Good grade. What ranchers wanted was a breed that could grow to marketable size rapidly and put on a maximum of weight with the least quantity of feed. Also, because Arizona cattle had to spend a portion of their lives on the range under conditions that included rocky soils, extreme weather, predators, and exposure to contagion, the animals had to have some natural ability to survive without constant attention. The wild *criollo* of which the Longhorn was the most famous type had eminently proven the most adaptable to wild conditions, but had long since been excluded from the market because of its inferior quality as beef.

Since the mid-nineteenth century, American cattle raisers had come under the influence of European, or more specifically, British efforts to scientifically breed cattle that were more productive of either milk or meat. Through controlled, selective reproduction, breeders established a number of distinctive cattle breeds. Societies were organized for the purpose of tracking so-called purebreds, which were animals whose distinctive characteristics could be bred true from one generation to the next. An animal was purebred if it could trace its pedigree to the progenitor of the breed with a minimum of out-of-breed influences. Two early British beef breeds were the Shorthorn and the Hereford. Both grew larger and fatter than earlier English cattle or the Longhorn of the New World and still retained a large measure of vigor and adaptability under open range conditions. Most range cattle were of mixed quality and characterized by the euphemism "commercial" herds to distinguish them from specialized purebred herds of the most progressive ranchers. Ranchers were already familiar with the benefits of the carefully developed purebreds that dominated the livestock raising areas of the East and Europe and postwar Arizona herds clearly displayed the influence of more selective breeding practices. Visually, it was obvious that by the mid-decades of the twentieth century, the white-faced Hereford was the dominant strain in the Southwestern states.[34]

The first registered Hereford herd in Arizona was imported by Colin Cameron of the San Rafael Ranch southeast of Patagonia. Cameron and his successor the Greene Cattle Company had the capital resources to grow its registered herd into one of the largest in the world. In 1945, it still numbered approximately 1,500

[34] The Hereford was an eighteenth-century product of selective breeding by cattle raisers in Herefordshire in southwest England who were desirous of fast-growing beef cattle that could be sustained largely on grass. The first successful breeding herd in the U.S. was established in New York in 1840 and from this start the Hereford quickly spread throughout the Midwest. Although the immediate post-Civil War urban market for meat in the northeastern states sustained a high demand for the inferior, but plenteous Longhorns of Texas it soon was apparent to cattle raisers that they would profit by replacing the scrawny natives with beefier beasts. In addition to its grass-eating virtue, the Hereford proved remarkably adaptable to rugged terrain and arid climate of the American Plains and Southwest. Despite the earlier introduction of Shorthorns to improve the range cattle of Texas, the Hereford quickly became the preferred breed. (Don R. Ornduff, "Hereford Cattle," *AC*, Vol. 1, No. 5, 4-7.

females and was one of the largest registered herds in the country. Few ranchers, however, had the resources to fully develop registered herds; there were perhaps a dozen by the early 1930s. These included, in addition to the Greene outfit, B.A. Packard (Douglas), Babbitt & Cowden (Phoenix), L.H. Manning (Tucson), the Schilling Brothers (Willcox), Kimble & Son (Douglas), and the University of Arizona. The Cowden Livestock Company, successor to Babbitt & Cowden, was notable for its adaptability to changing market conditions. In 1920, when the American agricultural sector was about to face one of its most trying periods, The Cowden Company formed a Hereford herd. They started with the purchase of two bulls from the Humbert & Son (Phoenix) herd, which derived from the well-known Scharbauer Hereford herd of Texas, and for which they paid the handsome price of $4,500. They followed this in 1922 with the purchase of forty cows from Kansas and additional bulls in subsequent years. Other ranchers made improvements as they could afford, importing bulls from such well-known sources as the T.E. Mitchell Ranch of New Mexico. The uneven improvement in Arizona range cattle and the dependence on imports to replace bulls led in 1932 to the founding of the Arizona Hereford Association. The association then started the Tucson Livestock Show and Hereford bull sale in order to promote Arizona breeders. By the end of the Second World War there were some 85 Arizona breeders of registered Herefords, and the Milky Way Ranch (Phoenix and Springerville) proudly advertised its pair of champion yearlings from the 1945 Pan-American Hereford Show in Dallas.[35]

Ranchers generally agreed about the benefits of improved breeding on the value of their product, although there were differences in opinion about what breeds or mix of breeds yielded the finest cattle. National organizations for the promotion of purebreds existed for Herefords, Shorthorns, Aberdeen (Black) Angus, and even the exotic Brahman. Arizona cattlemen were relentlessly barraged by advertisements promoting the unique and special characteristics of each. A few Arizonans became believers in alternative breeds, such as Sam Spitalay, who ran ranches in the Williams and Blythe areas and was a leading promoter of the hornless Black Angus. Another Angus aficionado, John R. Evans, whose Phoenix Angus Farm originated in 1910 as his father's dairy operation, began experimenting and diversifying his farm in the mid-1930s with cotton and crops. In the spring of 1945 he was one of the first breeders to adopt Angus as a full-scale business.[36]

A dozen or so Arizona cattlemen raised Black Angus in the mid-1940s, but the showplace among Angus herds was the great McCormick Ranch. Spread across ten sections of flat desert land north of Scottsdale, the

[35] Ibid.; Untitled, (1945) *AC*, 1:4, 8-9; Stanley, E.B. (1946) "Up and Up," *AC* 1:5, 24; Backpage advertisement, *AC* 1:4. The Milky Way Ranch was a regular national prize winner, receiving in 1950, for example the Grand Champion Female award at the National Western Stock Show at Denver (*AS*, February 1950, 9).
[36] Tomhave, W. H., "Aberdeen Angus Cattle"[with editor's note], *AC*, Vol 1, No. 6, 8-10; "Phoenix Angus Farms," *AS*, August 1952, 18-19.

ranch was the work and pleasure of Fowler McCormick, grandson of Cyrus McCormick, inventor of the McCormick reaper, and of the Standard Oil tycoon John D. Rockefeller. For many years, Fowler and his wife Anne owned a large farm at Barrington, Illinois where they raised a prize Ayrshire dairy herd as well as Angus. Like many wealthy Easterners, the McCormicks initially came to Arizona to enjoy its climate and decided to invest once they witnessed its growth opportunities. They acquired ten sections of desert land and began building an ultramodern facility with the best in barns, sheds, irrigation facilities, pens, and ponds. Arizona natives initially scoffed at the idea that the McCormick's black cattle could survive in the summer heat, but they not only survived, they thrived. Happy with their success, in 1951 the McCormicks finally sold their Illinois operations and moved permanently to Arizona.[37]

The Shorthorn has a longer history in the United States than other breeds, an early variation first arriving from Great Britain in 1783. It was less specialized than the Hereford, used for both milk and beef until a decisive split into specialized uses occurred in the twentieth century. Red-coated Shorthorns were the first to be used in the West to improve the Longhorns, although with mixed success, as the problem of Texas or tick fever continued to make improvement efforts difficult in that state. The leading proponent of Shorthorns in Arizona was Delbert "Del" Pierce. Del Pierce and his brother Bill began working on a 200-acre farm owned by their father, Clyde, who was manager of Southwestern Sash and Door Company. The farm was a mixed operation raising cattle, alfalfa, corn, citrus, cotton, and poultry such as geese, ducks, turkeys. Clyde's small grandchildren even profitably raised parakeets. His son Del eventually took over the livestock component of the farm, while Bill oversaw the farming.[38] They first became interested in Polled (hornless) Shorthorns in 1939, formed the Arizona Shorthorn Breeders Association in 1943, and organized the state's first Shorthorn sale in February 1944. Peer recognition came in 1946 and 1947 when his bulls won grand championships at the Arizona State Fair, and in 1947 he was beginning to sell heifers. The bulls sold by Del Pierce were not intended for purebred herds. Rather, stockmen used them to cross breed with other types. Prominent political figure H.S. "Casey" Abbott, for example, developed a satisfactory Shorthorn-Brahman crossbreed. Also, north around Springerville, a "hotbed of Hereford enthusiasts," Larry W. Colter introduced a large herd of purebred Shorthorns.[39]

[37] "Fowler McCormicks Choose Arizona," *AS*, September 1951, 27; "Desert Beauty in Black," *AS*, February 1953, 14-15.
[38] Delbert Pierce also operated a retail store for General Mills products ("Delbert Pierce Has Grand Opening of Sunbeam Feed, Seed and Supply," *AS*, April 1948, 32).
[39] "Shorthorn," www.wikipedia.org; Clinton K. Tomson, "A Short Shorthorn History," *Arizona Cattlelog*, Vol. 1, No. 7, 24-26; "Shorthorns on Irrigated Pastures," *AS*, September 1952, 18-19; "Shorthorn Breed in Arizona Progresses," *AS*, March 1948, 17. Abbott was the long-time head of Maricopa County's Planning and Zoning Commission and as such played a crucial role in developing its renowned park system (see William S. Collins, *The Emerging Metropolis: Phoenix, 1944-1973*, (Phoenix: Arizona State Parks Board, 2005).

The entry of the exotic Brahman into Arizona brought countless laughs to older cattlemen, its distinctive back hump and hanging fold of neck skin being well outside their general experience. This breed traced back to the zebu of India. It was first raised in the New World in Brazil and later transported north to the gulf coast of the United States. Brahmans are beef cattle resulting from cross-breeding zebu with European cattle and are particularly successful in hot, humid climates. Their primary appeal for Arizonans was their enormous size, with bulls weighing a ton or more. The pure breed was not so much an interest as the hope that a crossbreed might produce an animal both large and adaptable to a hot dry climate. Indeed, such a successful new breed was developed in the Brangus, a cross of 5/8 Angus and 3/8 Brahman. Paul Cornelius and Roy Hislop, two stockmen with land interests in Arizona, Nevada, and California, and owners of a feed lot near the Tovrea property east of Phoenix were among the first to show Brahmans at Arizona stock shows and they exported them as far away as South America.[40] Nearly as exotic as the Brahman was the white

Charolais cattle, ca. 1980. Arizona State Library, Archives and Public Records, Archives Division, Phoenix #01-4120.

[40] *Arizona Cattlelog*, Vol. 1, No. 9, 4-6; "Brahman," and "Brangus," www.wikipedia.org; Len Sime, "Ranch of the Month—Triple AAA Ranch Operators View the 'New Look' in Cattle," *AS*, March 1955, 13, 24.

Charolais, a beef cattle of French origins. Phil Tovrea owned a purebred Charolais, which he bred into stock he ran in Pima County. One day around 1942 he was speaking to Frank Campbell, who owned a large ranch between Ash Fork and Seligman, about the virtues of cross-breeding with Charolais. Frank jokingly asked him to save him a bull. This Tovrea did in 1943 and soon Campbell was running a large herd of Charferds, a cross of 1/2 Charolais, 3/8 Hereford, and 1/8 Brahman. Wayne Davis of Mesa led formation of a local Associated Breeders of America in September 1951, which promoted use of Charolais crossbreeds.[41]

The dominance of the Hereford began to lessen as ranchers experimented with crossbreeding in pursuit of the elusive goal of the cattle that would yield the most profit at the lowest cost. The Tucson Livestock Sale was initially a Hereford event in its first years until Hilton J. McKeown of Phoenix created a stir at the 1946 show with a display of four of his Black Angus. At the state's first Aberdeen-Angus Show and Sale, held in January 1948 with exhibitors from Arizona and California, stockman John Thompson of Winslow virtually bought the show with his purchase of the top seven prize bulls. Soon all breeds could be found at livestock shows such as that in Phoenix, which was first held in December 1948.[42]

Raising improved herds required capital investment. Registered purebred cattle were expensive to acquire and wise ranchers would match their investment in the animals with complementary investments in tools, buildings, and range improvements. This is one reason why the twentieth century rancher was far more concerned with losses due to predators such as mountain lions, wolves, and coyotes than his frontier-era counterpart. Prize-winning bulls could easily cost $10,000 and prices of $30,000 or more were not unheard of. The price would quickly rise much higher.[43] The names of top bulls were familiar to every rancher and their certification in the major regional livestock shows vital to the market. The University of Arizona had such a bull in the 1930s in its demonstration herd, but after it died in 1941 could not replace it due to the cost. A replacement came only in March 1945 after imaginative local cattlemen approached a local representative of Sears, Roebuck and Company, whose charitable arm, the Sears Roebuck Foundation purchased for $10,000 a bull from the Milky Way Ranch of Phoenix, which it donated to the university.[44] Since many ranchers operated on the margins of business solvency, purchase of Hereford stud bulls of any

[41] "We Switched to Charferds," *AS*, March 1952, 11; "Mesa Breeders Form New Breeders Group," *AS*, April 1952, 9; Harold W. Hunt, "Some Facts on the Famous French Charollais [sic], *AS*, March 1952, 13. This latter article is an example of the kind of publicity published in livestock periodicals by proponents of various breeds, citing their economic value. Hunt was California breeder of Charolais bulls.
[42] W.H. Tomhave, "Aberedeen Angus Cattle," *AC*, Vol. 1, No. 6, 8-10; "Arizona's First Aberdeen-Angus Show and Sale," *AS*, February 1948, 12; "Phoenix Stock Show is Lauded," *AS*, January 1949, 9.
[43] "$50,000 Paid For Bull By Milky Way Ranch," *AS*, February 1954, 44. The price here referred to was noted as among the top ten highest prices yet paid for a Hereford bull.
[44] E.B. Stanley, "A Step Forward," *AC*, 1:1, 24-25.

quality, let alone the sires of prize-winners, was a risky investment. Herd quality varied according to the resources of the rancher and in the absence of careful selection would tend to regress.[45]

Cattle ranching was always a volatile business. While some ranches operated for many years (sometimes under two or more generations of family ownership) there were also many new start-ups and liquidations. Particular brands might be perpetuated under different ownership implying a continuity of management that did not actually exist; it was simply impractical for a new owner to rebrand cattle. Also, since cattle were mobile, ranch operations could, and sometimes did, move to different areas as the investor purchased or sold parcels of land.

The most famous Arizona ranch developed during the postwar years demonstrates how flexible successful cattle operations could be. In 1945, the Hereford cattle of Alan Feeney's Milky Way Ranch began winning the first of many national and local cattle show awards. In the ensuing fifteen years, the Milky Way dominated the Arizona livestock scene, not only in show venues, but in the practical venue of cattle markets where stockmen sought out the most notable sire bulls for their herds. By 1950, it had a line of bulls traceable to the most prestigious of the Hereford pedigree that earned top prices and served as the foundation for numerous other purebred operations. The origin of the famous Milky Way herd was the Tennessee stock farm operated by the candy manufacturer Mars, Inc., maker of the Milky Way candy bar. Prior to the war, Feeney was the manager of the farm, a diversified beef and dairy operation. In 1944, he purchased the Hereford herd, retaining the Milky Way name because that was the name under which they were registered, and in November moved the operation to a 140-acre parcel then outside Phoenix, south of Camelback Road between 20th and 24th Streets. Feeney later purchased land near Springerville where a number of other Hereford raisers were located. The Milky Way was immediately the top Hereford breeder of in the state.[46]

Supplementary feed was one of the ranch proprietor's largest expenses. The days of tall virgin grass in Arizona had long since passed and repeated episodes of drought and the long-term effects of overgrazing forced stockmen to provide feed supplements such as hay. Alfalfa was readily available for purchase as a result of the expansion through the first half of the twentieth century of irrigated agriculture, first in the Salt River Valley and later in Yuma and Pinal counties. To avoid having to purchase all their hay and other feed,

[45] Breeding improved at a relatively rapid pace in the more controlled environment of eastern farms. In Texas, on the other hand, the scourge of Texas (or Spanish or Tick) Fever delayed significant improvements for decades because while the Texas Longhorns were immune to the disease, expensive imported breeding stock were highly susceptible. [see Laurie Winn Carlson, *Cattle; An Informal Social History*, (Chicago: Ivan R. Dee, 2001), pp. 94-103 for a narrative of how the unprecedented intervention of the federal government into animal disease control eventually eliminated this disease.]

[46] Bob Hebets, "Breeding Quality Herefords at Milky Way Ranch," *AS*, March 1948, 15, 22;

many ranchers included fields on their property, irrigated typically with pumped ground water. This merely substituted a capital expense in the form of ground preparation and irrigation equipment on top of recurring expenses for seed, pesticides, and field labor, and required a careful calculation of net costs. In addition, obtaining the best price for their animals required specialized feeds given in the final weeks prior to slaughter to bring up their weight quickly. In mid-century, such feed typically included barley and cottonseed products, mixed with vitamin and mineral supplements. There was no best mix as stockmen adjusted to the cost of each item and experimented with what seemed to work best. Feed products manufacturers were constantly marketing new products and mixes and conducting research to find cheaper means to fatten cattle. Molasses, for example, became a common supplement in the 1940s and corn cobs and other agricultural wastage in the 1950s.[47]

The typical ranch included fields set aside for feed crops, though few were entirely self-sufficient. Some were highly diversified farms in which cattle were but one product. Tom and Gertrude Greenfield's Tomar Angus Ranch at Marana, north of Tucson, was an example of a small, diversified farm. The couple had married in 1940, soon after Tom had graduated from UA, but were diverted from farming for three years while he played professional football with the Green Bay Packers. He then served overseas in the military in the last year of the war. After the war, they returned to Arizona where Tom got a job with Goodyear Farms. This gave him excellent experience with a large diversified operation, which he put to use when he became manager of the Santa Cruz Ranch located near Marana. He worked his own 180-acre Tomar Ranch while still managing the Santa Cruz. With the assistance of herdsman Jim Watson, who had worked for the McCormicks, the Greenfields built up their herd starting with just two Angus cows.[48]

Feed was not only an expense in itself, it required considerable labor to handle, mix, and deliver. Custom feedlots could handle this operation efficiently and they often provided additional veterinary and marketing services as well, but the cost was too high for all but final finishing. Stockmen could reduce their feed labor costs by investing in mixing equipment. For large operations with capital, there were gigantic feed mixing machines. Two popular large mixing machines were manufactured by the Roberts and Williamson companies.[49] Harry Hooker, who acquired his pioneer grandfather's Hooker Ranch near Sierra

[47] Jack Austine, "Cattle Feeding Changes Made," *AS*, January 1954, 25-26. Researchers of the decades found the bovine digestive system capable of processing an increasingly wider variety of vegetative and protein matter that had formerly been considered waste products. Growth hormones also became increasingly common after the 1950s, first in for dairy cattle and then for beef. Fortunately, this study, because of the limitations of its time period, can avoid consideration of modern feed methods. Interested readers may refer to Carlson (2001), pp. 268-85.
[48] "Ranch of the Month – Black Gold at Tomar," *AS*, August 1954, 15, 17.
[49] The function of the mill is to mix different ingredients in measured quantities into a nutritious feed. An examination of websites of modern agricultural equipment manufacturers indicated that while the basic function of mixing machines has changed little in the last half-century, there

==========

Bonita in 1933 employed about sixteen workers in 1948, but he found good help was both expensive and difficult to keep. So he invested $30,000 in a Roberts feed mill that replaced the work of several men. John Osbourne, who operated an 80,000-acre spread south of the Grand Canyon and a 695-acre feeding ranch near Arlington also invested in a Roberts-brand mill that could mix fifteen tons of feed per hour, reducing his labor usage to one man per thousand head of cattle fed. Feedlot owners such as J.C. "Charlie" Wetzler and R.C. "Rans" Spurlock, whose Circle One Livestock Company at the Lizard railroad siding 22 miles

This ad for Southwest Feed and Seed emphasizes its modern manufacturing methods. *Arizona Cattlelog*, April 1970, p. 18.

has been a decided shift away from stationary machinery of the type marketed during the 1950s in favor of smaller, mobile units that can be hauled by truck to where they are needed. This seems to be true even of machinery marketed towards the large feedlots.

west of Phoenix, could feed up to 10,000 animals with its huge, custom-built mill, which featured twenty feet of underground storage in five bins and the same above ground. Ranchers with fewer capital resources might use their own ingenuity to construct smaller feed mixers of their own.[50]

Ranch near Winkleman, ca. 1950. Arizona State Library, Archives and Public Records, Archives Division, Phoenix #02-4502.

[50] Advertisement, *AS*, February, 1950, 15; "Sierra Bonita Ranch," *AS*, March 1948, 13, 18; "Efficient Methods Pay Off," *AS*, February 1950, 15; "Circle One at Lizard Acres," *AS*, April 1953, 16-17. John Osbourne was raised on a ranch on the Cimarron River in Kansas and came to Arizona in 1908 with little more to his name than a horse and bedroll. His first job was with the Chiricahua Cattle Company at old San Carlos, where he learned how things worked on a big ranch. He eventually became the ranch's manager and stayed until 1925. He then went out on his own, running some 2,000 head by permit on Indian reservation land. After non-Indian leases were cancelled in 1934, he bought the Diamond S Ranch, 25 miles south of Prescott, but soon removed to a spread of some 70,000 acres north of Williams, where he ran a cow and calf outfit. In 1948 he invested in the Arlington ranch, which was then in poor condition, but which he improved greatly by clearing brush and mesquite, building irrigation ditches, feedlots and fields. This operation was a model of efficiency that he ran with his two sons-in-law and a few hired hands. Wetzler and Spurlock's feed operation, known as Lizard Acres, included 500 acres under cultivation and 1,200 acres of desert. They employed between 30 and 35 workers who lived, not in bunkhouses as did cowboys of old, but in trailers on the property. Spurlock also owned another ranch in Navajo County.

In states like Arizona, where public land constitutes a major portion of grazing range, the policies of federal and state governments greatly affect the structure of the cattle ranching business. Two federal agencies, the Bureau of Land management (BLM) and the Forest Service, along with the Arizona State Land Department, are responsible for administering systems of grazing permits within their respective jurisdictions. On the several Indian reservations, Tribes initiated livestock development programs in cooperation with the Bureau of Indian Affairs. These permits granted stockmen the right to graze a specific number of cattle and to construct certain range improvements such as fencing and water tanks to regulate and sustain their herds. In addition, the agencies used a portion of the fees from grazing permits to directly construct roads, fences, stock tanks, and other improvements that benefited grazers. Many ranches, particularly the larger, consisted of a combination of private land and public land with grazing rights. There were even stockraising ventures that existed entirely on leased and permitted lands. In the period prior to the New Deal, white ranchers could hold permits to graze on reservations, but this practice was discontinued when federal policy changed in favor of assisting Tribes in developing their own economic resources. Under the Taylor Grazing Act of 1934, federal lands had been organized around grazing districts that decentralized range management and allowed local ranchers a strong voice in how the public lands in their areas were utilized. The open range now existed only in Hollywood westerns and there were few stockmen who truly regretted the evolution in land management that secured their right to use the land, even at a fee, and reduced the effects of overgrazing that had greatly affected large areas of once prime grazing range.

Regulation of public land grazing was only one area of government activity affecting the cattle industry. The state of Arizona also regulated cattle through its Livestock Sanitary Board, which maintained records of cattle brands and issued licenses for slaughter and retail meat sales. Other state activities included veterinary inspections for communicable livestock diseases, especially foot- (or hoof) and-mouth disease, and predatory animal control. The state legislature and county governments controlled property tax rates and in the early decades of the century livestock ranches contributed a large share of property tax revenues. The county and state government also sponsored fairs where livestock could be competitively displayed.

The end of federal price regulations by 1946 marked the beginning of a six-year period of rising cattle prices. Just as the market seemed about to stabilize around 1949-50, the outbreak of hostilities in Korea caused a renewed surge in cattle and retail meat prices. Administrator Michael V. DiSalle of the Office of Price Stabilization responded to rapidly rising consumer meat prices in the spring of 1951 with an order for an 18 percent rollback in prices. This order sparked outrage among stockmen, who organized a lobbying effort to rescind it. DiSalle, speaking before a hostile audience at a meeting of the American Meat Institute in Phoenix on September 26, 1951, reported cases of evasion of the regulations and he refused to give in to what he referred to as “threats to deprive American families of beef unless we surrender to the selfish interests purporting to represent the meat industry.” He was responding to warnings that price regulation

would precipitate a decline in supply and growth of a black market in beef. Yet despite the federal attempts to stabilize commodity prices during the Korean War, between 1951 and 1952,cattlemen enjoyed the highest, inflation-adjusted prices for their products that would occur during the twentieth century. It was not until 1952 that oversupply combined with a drop in consumer demand to end the price boom.[51]

In a move affecting agriculturalists in general, President Truman, on August 28, 1950, signed a bill extending Social Security to farm workers, an act which took effect at the start of 1951. Farm workers had been exempted from Social Security's original provisions and the change only accelerated the effort of ranch owners to replace employees with labor-saving machinery wherever possible. Self-employed ranchers remained outside the system for the time being. Cattlemen received more favorable federal tax treatment as a result of the Revenue Act of 1951 that made the gain in price of cattle a capital gain rather than strictly income. Also during this period, as previously described, mandatory federal meat grading came to an end. However, it too was temporarily revived during the Korean War. In the long run meatpackers and retailers found that the marketing benefits of federally inspected beef were worth the cost and most voluntarily rejoined the program.[52]

A powerful display of federal authority benefiting Arizona cattlemen followed the diagnosis of foot-and-mouth disease in Mexico at the end of 1946. Foot-and-mouth disease is a viral infection that is extremely damaging and often fatal to cattle and other livestock. The discovery of the outbreak was quickly followed in February 1947 with the formation of a joint Mexican-American Commission to seek ways to control its spread. A ban on Mexican cattle imports was immediately imposed, which severely affected Mexican stockmen while providing American stockmen with protection against competition as well as disease. Investigations into the occurrence of foot-and-mouth disease found cases in at least six Mexican states.

The situation facing Mexican authorities was complicated by several factors. In the first place, the rugged terrain and poor roads would have made control difficult even if there had been cooperation by local cattle raisers. In the second place, cooperation was very difficult to obtain both because locals were commonly illiterate and often had little understanding of the disease. Control usually implied slaughter of animals exposed to the disease and the Mexican authorities killed approximately a half million animals in 1947. Already distrustful of government officials and seeing their livelihood threatened, locals failed to cooperate. The whole effort slowed considerably following the murder of a Mexican veterinarian and seven soldiers. American officials initially banned a range of Mexican meat products and only began to lift some

[51] "This Isn't Price Control… It's Confiscation!" *AS*, May 1951, 14; "DiSalle Berates Meat Institute," *AS*, October 1951, 14, 51.
[52] *AR*, January 1951, 14; "Stockmen Are Now Entitled To Their Capital Gains On Sales of Animals After Winning Revenue Battle," Jan.-Feb. 1952, 45.

restrictions at the end of 1950. It was not until the start of 1955, eight years following the outbreak, that Mexican cattle were fully permitted to enter the United States.[53]

Education and research were important areas in which the state and federal governments gave support to agriculturalists, in general, and ranchers in particular. At the federal level, the U.S. Department of Agriculture administered regulations for inspection and grading, a dubious benefit in the eyes of many stockmen, and supported research aimed at beef and dairy improvement. Through the Forest Service, the USDA was responsible for the administration of national forests and for issuing permits and formulating regulations for grazing. While the Forest Service naturally received criticism to the extent that it responded to priorities other than those of stockmen, it was generally perceived to be working for the common good of all public lands users. Immediately after the conclusion of the war, the Southwestern Forest and Range Experiment Station began conducting numerous tests on methods of range management, optimal grass seeding methods, weed plant control, and better breeding practices. For example, using diesel oil they tested methods of controlling mesquite, which was spreading across thousands of acres of former grass land.[54] The department also sponsored veterinary research into cattle diseases and was responsible for a national effort to contain disease outbreaks and to prevent their spread.[55] In addition to the foot-and-mouth disease outbreak that closed the Mexican border to cattle for years, throughout the 1950s the USDA conducted an aggressive program to eliminate brucellosis, a bacterially-transmitted disease that causes a high incidence of abortions in cows or weak calves. The USDA sponsored research and control programs for cattle pests such as grubs, the offspring of heel flies that burrow into the hide of cattle causing tremendous loss for the cattle industry.[56]

[53] I.B. Boughton, "A Survey of the Foot and Mouth Disease Problem in Mexico," *AS*, August 1948, 11, 22, 24, 27; "Lift Mexican Ban on Canned Meat," *AS*, January 1951, 22; "Border to Reopen," *AS*, January 1955, 38.
[54] George E. Glendering, "New Range Reseeding Research Program in Arizona," *AS*, February 1948, 11; Mack E. Roach, "Controlling Mesquite With Diesel Oil Pays," *AS*, August 1953, 16-17.
[55] Federal authority to engage aggressively with cattle disease had been built up over several outbreaks in previous decades. In 1917, the USDA published procedure for quarantine and slaughter, which were the methods seen as most effective in eradicating foot-and-mouth disease. An outbreak in California in 1924-25 led to panic bans on beef not only from that state, but in the Canadian case, from all U.S. western states. Arizona's Governor Hunt created a political crisis, an extension of his, long-standing fight with California over Colorado River water rights, by closing the state's border with National Guardsmen. Top officials in the Coolidge Administration, including Commerce Secretary Hoover and Agriculture Secretary Wallace brokered a deal in which the federal government paid the cost of border inspections, quarantine, and a mass slaughter of animals. Over the course of two years, 58,791 cattle, 21,195 hogs, 28,382 sheep, 1,391 goats, and 22,214 deer were killed in the process of eliminating the disease (Kendrick A. Clements, "Managing a National Crisis: The 1924 Foot-and-Mouth Disease Outbreak in California," *California History*, Spring 2007, 23-42).
[56] "Promising Insecticide for Cattle Grubs," *TSM*, January 1959, 61.

Educational programs at the state universities were better appreciated by cattlemen. A formal education in animal husbandry became the norm for ranch operators in the postwar years. Numerous graduates of the University of Arizona's college of agriculture went on to become partners with their parents or to found ranches of their own. Harold Thurber, after Alan Feeney one of the state's most prominent Hereford breeders, sent three sons to agricultural college. Two of them, Harold, Jr. and Seymour "Sam," went on to become educators in the University of California extension services.[57] To assist students with new methods of stock improvements, the UA had since the 1930s maintained a purebred Hereford herd. In succeeding years it added stock of other breeds as interest in cross-breeding increased. Arizona State College in Tempe, later Arizona State University, also offered an education in animal husbandry and cooperated in outreach education efforts among older stockmen. Like the university, ASC maintained a small Hereford herd.

The Phoenix Technical School entered the field in 1949 in partnership with the Soil Conservation Service and the Tempe Soil Conservation District. The school's director, J.J. Kayetan, wanted to provide students with the opportunity to design and build a small working ranch and to learn methods of improved cattle breeding, feeding, and irrigation. The idea became a reality when Kayetan found a small, little-used farm south of Phoenix owned by the Goldwater brothers, Barry and Robert. Being civic minded and not using the land anyway, the Goldwaters leased their farm at a nominal rate and boosted it in public. "It's good business all around" to support agricultural education, said then-Phoenix City Councilman Barry Goldwater.[58]

One of the leading educators in the field of cattle raising was Dr. Everett Lee Scott. Scott was born to a stock raising family in Mineral Wells, Texas, in 1896. His father was an early proponent of the benefits of improved breeding and of Herefords in particular. The younger Scott would in his turn become one of the breed's leading proponents in Arizona and he would eventually be lauded as one of the most important figures in the great improvements shown by Arizona cattle in the postwar era. Scott graduated from Colorado A & M, then received a master's degree at Iowa State College. He arrived in Tucson in 1924 and recognized the opportunity that existed to improve the marketability of Arizona cattle. He worked as an animal husbandman at the university for two years before going to Indiana where he earned a doctorate in veterinary science at Purdue, and then returned to UA and taught until 1937. Leaving the university environment and entering the private sector, Scott moved to Phoenix where he began developing the

[57] "Sam Thurber Joins Father," *TSM*, September 1959, 4. Harold Thurber's three sons all entered the cattle business in one way or another. His eldest, Harold, Jr., became manager of the famous Tejon Ranch in California in 1959 after working with the University of California extension service. Middle son Walter "Bud," became a partner in the Bridwell Ranch in Texas. Youngest son Sam worked with the University of California for many years.
[58] "Learning By Doing Is Basis Plan at the Phoenix Tech Farm," *AS*, March 1950, 12.

Suncrest Ranch into a model Hereford breeding establishment. As an indefatigable advocate of the Hereford, Scott worked with many other ranchers to take advantage of improved breeding stock. He personally selected the foundation stock for the UA Hereford herd and for several private ranches as well. He was one of the founders of the Arizona Hereford Association and was one of the organizers of the Tucson Livestock Show and later the Arizona National Livestock Show in Phoenix. The Suncrest Ranch had land in Phoenix, then later Scottsdale, Springerville, and for a time Gunnison, Colorado. Later important Hereford breeders like Harold Thurber and Foy Herschede owed much to the advice and stock of Scott's Suncrest.[59]

In addition to their private efforts, cattlemen organized to promote their joint interests through organizations such as the American National Livestock Association and the Arizona Cattle Growers Association. Both of these groups organized political lobbying efforts and kept their members informed about issues of legislation and taxation. Each held annual meetings that were important in spreading information about industry best practices. In addition to these broad-based organizations, cattlemen also joined specialized trade groups like the Arizona Cattle Feeders Association. For breeders there were specialized organizations at both the national and state levels dedicated to promoting the value of virtually every distinct breed. These organizations also served as outlets for many cattlemen seeking positions of respect and leadership among their peers. Ranch wives had their own organization in the Arizona Cowbelles, which provided sociability and information that made rural life more tolerable for many women.

An important difference between twentieth century cattle raising from its frontier-era precursor was the specialization of ranch operations to the specifications of particular aspects of the meat industry. By 1920, the broad pattern of cattle raising, processing, and meat retailing that would influence practices in Arizona was established and would remain stable through the rest of the century. Stated in the broadest of terms, Arizona was part of a region of production whose primary centers were in Texas and New Mexico, with additional—though far lesser—sources of supply from northern Mexico, Colorado and as far as Oklahoma and Louisiana. Arizona was and would remain a minor source of cattle due to the relative aridity of its climate and marginal quality of its range land. The ultimate destination of this regional supply base was the rapidly growing urban markets of California where the processing plants of the meat packers were located. The Atlantic & Pacific Railroad (later Atchison, Topeka, and Santa Fe, and now Burlington Northern and

[59] *ASM*, December 1958, 31-32.

Santa Fe) and Southern Pacific (now Union Pacific) Railroad were the primary corridors of transportation linking supply and demand.[60]

Ray Cowden of the Cowden Livestock Company exemplified how a successful feeder operation evolved between the 1910s and 1940s. Cowden moved to the Salt River Valley along with his older brother from Springfield, Missouri, in 1912. This was just at the moment when the Theodore Roosevelt Dam on the Salt River was newly completed and the Valley's irrigated acreage was beginning to expand rapidly. The elder Cowden brother started in the feeding business by taking cattle from the Babbitt Brothers, along with a few of their own, and pasturing them on fields of alfalfa and barley, supplemented by stacks of hay in the alfalfa fields. As early as the winter of 1914-15 they experimented with feed lots but did not invest in this method in earnest until 1917 around the time that the elder Cowden died and Ray took over the operation. At that time, Cowden built some silos and began feeding the cattle a mixture of ensilage, cottonseed meal, grain and hay. At first the operation took in two- and three-year olds but switched to calves around 1926-27. These they set out in the alfalfa fields for up to a year and a half before transferring them to feed lots for finishing.[61]

The growth of cattle feeding in Arizona and its rank among the states is shown in Table 1. By the 1960s, Arizona ranked generally ninth among cattle feeding states. This position would remain relatively stable for the next several decades.[62]

[60] California has had since the Spanish colonial era a large cattle raising industry, far larger than that which ever existed in Arizona. But in addition to its own growing urban demand for beef, California cattle raisers have taken advantage of the lucrative Asian market and exported much of their produce, which explains in part why the United States exports cattle and meat at a rate not far below the quantity it imports from countries like Canada and Argentina. The U.S. imported about 700,000 head of cattle in 1983 and exported about 500,000 head. In 1984, the Reagan Administration negotiated an increase in Japan's quota of imported beef from 30,800 to 37,700 metric tons per year (Skaggs, 214). In 2006, the U.S. imported about 3.08 billion pounds of beef and veal, with the major suppliers being Canada, Australia, New Zealand, Uruguay, Brazil, and Argentina, in descending order of importance. Imports of live cattle from Mexico and Canada numbered approximately 2.29 million head. Exports of beef and veal in 2006 totaled some 1.14 billion pounds with leading destinations, in descending order, Mexico, Canada, China, and Japan. (USDA Economic Research Service, Annual and Cumulative Year-to-Date U.S. Livestock and Meat Trade, www.ers.usda.gov/Data/MeatTrade.

[61] Cowden, E. Ray (1946) "Feeding Cattle in the Salt River Valley; Past, Present, and Future Predictions," *AC* 1:7, 2-4.

[62] The quality of fed cattle from the Unites States accounts for its importance as a beef and cattle exporter despite remaining a net cattle and beef importer. The U.S. reexports a large quantity of meat products to countries like Canada and Mexico which were the original suppliers of live cattle.

==========

Table 1. Fed Cattle in Arizona and the U.S.

Year	Cattle fed as of Jan. 1 Arizona (thousands)	Cattle fed as of Jan 1 U.S. (thousands)	Arizona Rank in U.S.
1930	23	3,113	21
1935	28	2,215	16
1940	64	3,633	16
1945	60	4,411	20
1950	59	4,390	16
1955	169	5,795	11
1960	265	7,535	9
1965	348	9,483	8
1970	510	13,249	9

From *The Arizona Cattle Feeding Industry*, Technical Bulletin 191, University of Arizona Agricultural Experiment Station, Tucson, 1972.

Tribal governments continued their efforts to promote viable reservation economies by further developing their cattle raising efforts.[63] The San Carlos Apache Tribe relied on cattle as one of the mainstays of its economy. Legal grazing by non-Indians had been phased out beginning in the late 1920s and the Tribe had taken advantage of the Indian Reorganization Act of 1934 to reconstitute its government and to create a new corporate organization to undertake economic development. The Tribe as a whole raised its own herd of registered Herefords, which it used to support its own needy members—it was referred to as the "Social Security Herd"—and to form the basis of improved herds among other members. Grazing land on the over 1.6 million-acre reservation was divided among several independently operating grazing

[63] See the Cattle Ranching in Arizona, 1540-1950 MPDF for case studies of cattle raising on the San Carlos Apache Reservation and the Tohono O'odham (formerly Papago) Reservation. Readers may note the lack of references here to Arizona's largest tribe, the Navajo Nation. The pastoral economy of the Navajo Reservation was overwhelmingly dominated by sheep, horses and goats, with cattle of marginal significance. The great controversy over livestock reductions during the 1930s revolved around these animals. Interested readers may consult Donald L. Parman's *The Navajos and the New Deal*, (New Haven: Yale University Press, 1976).

Trail drive of the San Carlos Apache Tribal herd along Yellowjacket Trail. Western author Stella Hughes, right foreground, *Arizona Cattlelog*, April 1965, p. 30.

associations. A young Tribal member wishing to enter the ranching business might begin by borrowing twenty head of cattle. These he would have to repay after eight years along with two additional head as interest. By 1953, the Tribe had loaned over 2,200 head of cattle to assist many of its members in entering the business. The Tribe also organized regular cattle sales at different points on the reservation. Tribal policy discouraged the accumulation of cattle within families. If a member of an association died, his cattle was sold and the proceeds disbursed among his heirs, and his place in the association was taken from a waiting list of applicants. In the good years that followed the war, the Tribe enjoyed relatively high earnings from its cattle industry, proceeds from which helped to pay for a Tribal rodeo grounds, a recreation hall, a swimming pool, public libraries, the council hall, and a clinic at Bylas.[64]

In 1955, the San Carlos Tribe selected an experienced Anglo stockman to manage the Tribal herd. Mack Hughes, the son of an old hand at the Hashknife Ranch, had learned the skills of cowboying at that famous outfit. At over 1.6 million acres, the San Carlos Reservation was one of the largest cattle ranches in the

[64] Clarence Wesley, "World's Largest Cattle Ranch," *AS*, April 1953, 14.

world and it was Hughes' responsibility to manage the herd and its improvement program, along with marketing, and the training of Tribal members who would eventually take over full responsibility. Until the end of the 1930s, cattle had been marketed from the reservation through a system of sealed bidding, but this was replaced with cattle drives to various loading points on the railroads, and later highways, where stockmen could take advantage of the increasing number of auction markets. Although trucks increasingly provided the primary means for transporting cattle, the San Carlos herd was one of the last to be driven long-distance to an auction market. From the rugged 225,000-acre range along upper Eagle Creek in Graham County, Hughes would oversee the roundup of cattle that were nearly wild and had rarely seen a human. The Apache cowboys packed mules into their back country for weeks to gather up to 6,500 head of cattle then drive them along the Yellowjacket Trail, a path dating back to the nineteenth century. This old cattle trail, one of the last used in Arizona, was finally made obsolete around 1970 by a new highway.[65]

Years of Challenge, 1953-1958

For most cattle raisers, the election of Republican Dwight D. Eisenhower as president along with a Republican majority in Congress offered the opportunity to restore federal intervention in the economy and in the agricultural sector in particular to something resembling the pre-New Deal era. No one expected a complete rollback to *laissez faire*, and probably few really desired it. This had been demonstrated in 1948 when the Republican promise to repeal the New Deal legacy helped drive most farmers into the Truman camp. Still, for the first two years of the Eisenhower Administration and until the restoration of a Democratic Congress in 1955 there was little likelihood of any important federal initiatives in the agricultural sector. This was certainly the signal given by Eisenhower's appointee for Secretary of Agriculture, Ezra Taft Benson, who made no secret of his opposition to federal activities that hinted of socialism. Benson, who later served as president of the Church of Jesus Christ of Latter Day Saints, was one of the most conservative members of Eisenhower's cabinet, and throughout his eight years as Secretary of Agriculture he made every effort to halt the spread of federal programs.

Soon after his inauguration, Eisenhower was able to establish a lasting ceasefire in Korea and so eliminate wartime price stabilization regulations that had so irked cattlemen. The future for free market cattle raisers appeared promising, but the situation quickly turned adverse. Shortly before fighting broke out

[65] Stella Hughes, "San Carlos Cattle Drive, Part 1," *AC*, April 1965, 30-35; Stella Hughes, San Carlos Cattle Drive, Part 2," *AC*, May 1965, 24-28; "Our Cover," *AC*, July 1969, 28-30.

in Korea, the national cattle inventory had risen sufficiently to cause a small decline in prices. Renewed war again drove prices to record levels and despite price controls, cattlemen generally enjoyed a bonanza market such as they would never experience again. Prices began to slip in the spring of 1953 and continued to slide downward for the next several months. The timing was particularly unfortunate in that drought was parching much of the western range land to the extent that it was impossible for ranchers to withhold cattle from the market. Furthermore, restrictions on the importation of Mexican cattle because of the threat of foot and

Cattle ranch ca. 1960. Arizona State Library, Archives and Public Records, Archives Division, Phoenix #02-9282.

mouth disease were lifted at the end of 1954. This factor alone quickly resulted in a great influx of competing Mexican cattle, some 343,000 head during 1957.[66] Soon, heavily leveraged ranchers were experiencing a severe financial crisis.

At the beginning of 1953, the American National Cattle Growers' Association had given Secretary Benson its full support for his plan to eliminate federal price supports. The national organization held to this view even as cattle prices fell and many ranchers began to feel the financial squeeze. The organization split over the question of federal price support and in the summer of 1953, a new organization, the United Livestock Producers' Association organized at a Texas convention to represent the interests of threatened ranchers. James M. Smith, a Graham County rancher and member of the Arizona State Senate, was a vice president of the new organization and began soliciting support for an Arizona branch. He wanted, he said "to get something done to keep the little cattleman from going broke before it is too late."[67]

At the initial organizational meeting held on November 14th at the Hotel Westward Ho in Phoenix, 56 cattlemen joined the new group, signaling that the Arizona Cattle Growers' Association did not speak for everyone. Politicians were also split on the issue. The state's junior senator, Barry Goldwater, dismissed Smith's effort saying that 95 percent of the state's cattlemen opposed price supports, but the senior senator, Carl Hayden, had actually attended the organizing meeting of the United Livestock Producers' Association. It was a question of fairness, said Smith. The federal government currently offered price supports to several agricultural commodities such as cotton, wheat, and corn, but not for cattle. He personally directed an appeal to Benson to support an extension of the current support received by these commodities—90 percent of parity—to cattle. This Benson refused to do, saying that such a program would be expensive, difficult to end, and would require a broad expansion of federal regulations in the meat industry, including mandatory grading. He would go only as far as supporting the modest proposals of the American National Cattlemen' Association such as drought relief, credit assistance, and the purchase of beef for foreign aid, the military, and school lunches. Responding to complaining consumers, the American Meat Institute tried to shift the blame for the increasing gulf between live cattle and retail beef prices from the meatpacking industry to labor and transportation.[68]

Between 1953 and 1957, the western states experienced their driest years since the 1930s, severely aggravating the financial woes of cattlemen already beset by low prices. Although officially opposed to

[66] "More Cattle Imported From Mexico," *AS*, April 1958, 26.
[67] "Graham Cattle Raiser Favors Price Support," *AS*, November 1953, 13.
[68] "Willcox Cattle Sell Low," *AS*, November 1953, 13; "Program Alternatives to Cattle Controls, *AS*, November 1953, 64; "Benson Lists Faults in Beef Support Idea," *AS*, December 1953, 18; "Smith Says Price Supports Needed to Save Cattlemen," *AS*, December 1953, 15,19; "Meat Group Explains Beef Price Spread," *AS*, December 1953, 56.

most federal intervention in their business, many gratefully accepted emergency federal assistance that followed Secretary Benson's declaration of eight Arizona counties as drought disaster areas. This move shifted to the federal treasury one-half the cost of hay shipping and allowed cattlemen access to lower cost grain from the Commodity Credit Corporation. Also, stockmen in drought areas qualified for special Farmers Home Administration loans. It was noted in addition that the effects of the drought were not as severe as during the depression years because of improved water resources and range management practices that had been developed since the New Deal. These efforts to make federal land more productive for livestock continued under Benson's direction. The Forest Service, for example, continued efforts to clear brush, juniper, and other water-consuming plants that competed with cattle. President Eisenhower in 1956 signed a bill granting a refund of gas taxes for agricultural and ranching use. This was followed at the county level by a move of the Arizona county assessors to cut the minimum taxable value of cattle by 40 percent.[69]

Despite tariffs that raised the cost of cattle imports, the quantity of cattle crossing the border after the lifting of the foot-and-mouth disease restrictions grew to several hundred thousands per year. There was no market rationale for exporting U.S. cattle to Mexico, but in 1956 the Export-Import Bank of Washington provided Mexico with a loan of $5 million in order to pay for the import of cattle from areas affected by drought. Arizona stockmen gained the most benefit from this effort, supplying 10,343 out of 16,362 head sold under the program. However dubious the economics of the program might have been, it was renewed with another $5 million loan the following year.[70]

As if drought and oversupply were not enough to devastate cattlemen, other plagues arose to threaten their herds and livelihoods. In 1953, Yellow Clover aphids attacked the alfalfa fields in several states, causing severe losses among growers, driving up hay prices, and forcing cattle feeders to substitute higher cost materials for feed mixes. For cattlemen like John H. Evans, owner of Phoenix Angus Farms on west Van Buren Street in Phoenix, the aphids along with the overall decline in prices forced a complete reorganization of his business methods. He had been one of the first cattlemen to adopt Aberdeen-Angus cattle as his preferred breed, starting with 110 head in 1944. Declining prices had driven this down to a mere 35 cows and a single bull, and when the aphids struck, he was forced to plow under his feed crop field, later

[69] "Arizona Drouth Still Critical," *AS*, June 1955, 18, 24; Farm Gas Tax Refund Coming," *AS*, June 1956, 22; "Arizona Cattlemen Get Tax Cut," *AS*, January 1957, 55.
[70] "$5 Million Mexican Cattle Buying Program Concluded," *AS*, July 1957, 37; "Another Loan to Mexico," *AS*, September 1957, 68.

trying to raise corn as a substitute. In mid-1956, with his son in the Air Force and urban development pressures creeping towards him, he despaired of his family's future in ranching.[71]

At the same time that aphids were spreading across alfalfa fields, a virus began attacking barley crops. Damage varied from mild to severe in some locations. Another disease affecting cattle directly, brucellosis, became widespread across the United States in 1953-54, prompting a major USDA eradication effort. It was long and slow, however, and officials continued the effort throughout the remainder of the decade. The impact drought and plague affected all ranchers to some extent. Two who suffered, but successfully fought back were Rob and Mary Hooper. The Hoopers had started their ranch in 1954 on eleven sections of rugged land near the Little Colorado River. It was an inauspicious time and drought forced them to reduce their herd from 130 cows to 80. Then brucellosis struck. Unwilling to surrender the ranch of their dreams, they worked closely with veterinarians in the USDA's eradication effort, and their herd was the first in Arizona to be declared brucellosis-free at the beginning of 1958.[72]

Hereford raisers, who during the 1950s accounted for approximately 90 percent of all Arizona cattle, were baffled by the appearance of dwarf cattle in their herds. When this occurrence was noted across the country, a serious crisis emerged. Studies revealed that dwarfism resulted from a genetic defect had been propagated among the breeding stock. Ranchers who made their living raising and selling purebreds suffered losses as they tried to track down affected cattle and rid their herds of the defective gene. Arizona's foremost Hereford breeder, Dr. E.L. Scott, attacked the problem aggressively just before his death in September 1956, by slaughtering any cattle in his breeding herds that might be affected. In addition, he imported two unaffected bulls from England and began building up a new genetic line. Eventually, Scott's Suncrest Ranch, under the direction of his son, Bob, marketed what they called their Silver Sterling line, whose stock of sires were quickly purchased by stockmen throughout Arizona and nearby states. It was eventually recognized that purebred herds did not have sufficient genetic diversity and in subsequent years ranchers would begin exploring the advantages of cross-breeding to improve their herds.[73]

[71] "Alfalfa Damage Forces Changes in Feeder Rations," *AS*, January 1956, 66; "Changing Times Cause New, Better Methods," *AS*, August 1956, 17, 30; "Yellow Dwarf Attacks Barley," *AS*, November 1956, 33.
[72] "Brucellosis Remains A Serious Health Threat," *AS*, October 1958, 25; Leonard N. Sime, "Rob and Mary Hooper Have Arizona's No. 1 Brucellosis-Free Ranch," *AS*, January 1958, 55.
[73] "The Sterling Silvers of Suncrest," *AS*, September 1957, 20, 42; Research Scientists Report of Dwarfism," *AS*, September 1957, 15, 58; "AHA Seeks Added information on Voluntary Dwarism Survey," *AS*, October 1957, 76; "Suncrest Hereford Sale Brings $367.48 Average," *AS*, December 1957, 30.

Steve Bixby, president of the Arizona Cattle Growers' Association, admitted, in early 1956, that "many members are on the ropes and groggy, but few are giving up."[74] Most association members refused to press for additional federal intervention beyond temporary emergency relief measures, agreeing instead to support the work of their associations to promote increased beef consumption. Judging that the work of the American Meat Institute was insufficient for beef producers, members of the American National Cattlemen's Association formed the American Beef Council in 1955 to undertake a new marketing campaign. Arizonans contributed $9,500 towards the Council's $600,000 marketing campaign in 1956. Frank Armer, head of the local Arizona Beef Council, encouraged Arizona stockmen to support the joint effort by donating a nickel of the sales price they received on the sale of every head of cattle.[75]

Severe economic conditions encouraged modification of marketing practices to lower costs. Since the first transcontinental railroads crossed Arizona Territory in the 1870s, Arizona stockmen had concentrated their delivery of animals to a relatively small number of railroad terminal points, a practice that facilitated the supply of animals to meat packer's in the California market. This system eroded slowly after trucks became an important piece of agricultural equipment in the 1920s and farm-to-market roads were improved. At first, trucks facilitated delivery of cattle to existing loading points in towns like Phoenix, Winslow, Benson, Williams, and Willcox, but after World War I there emerged new local venues for cattle auctions at which buyers could practically buy cattle directly off the ranch. According to one source, while there were only approximately forty auction markets across the West in 1935, this number grew quickly after the Second World War to 460 by 1951. These auction markets handled some 11 million head of cattle worth about $1 billion. The advantage of auction markets to stock raisers was more immediate access to a larger number of buyers and so a better opportunity to receive the true market value for their product. Truck transportation helped to reduce losses and shifted delivery costs to purchasers. In addition, since stockmen regularly purchased cattle as well as sold it, auction markets gave them instant access to the cattle from many potential sellers. An example of the auction venues that were being built in virtually every cattle community was the Willcox Livestock Auction Barn, constructed with modern pen and display facilities in the mid-1950s, which sold some 300 head per week.[76]

[74] "Cattlemen "On the Ropes and Groggy." Still Fighting," *AS*, March 1956, 19, 24.
[75] "Beef Council Initiates Industry Survey," *AS*, January 1956, 29; "Yuma Cattlemen Give Views on "Check-off" System," *AS*, January 1958, 36, 39.
[76] J.L. Sorenson, "Auctions Play Major Role in Cattle World," *AS*, January 1956, 15, 44-6; Rex Emlich, "Willcox Area Is Center of Great Agricultural Growth," *AS*, April 1956, 30, 34.

==========

Located near the famous Tovrea stockyards east of Phoenix, the Cornelius Livestock Company was the state's largest auction venue during the 1950 from 1950 through the early 1970s. *Arizona Cattlelog*, February 1970, p. 15.

Phoenix's famed housing developer, John F. Long, creator of the Maryvale area west of Phoenix, entered the cattle business in 1956. More accurately, he was in the land development business and since much of the land he purchased was agricultural and not always immediately ready for subdivision, he used cattle as an intermediate step to avoid underutilizing land. Long's strategy was shrewd since letting the

land's agricultural status lapse would have voided its favorable property tax treatment. Long also happened to have a cousin, Charlie Roer, who was an experienced cattleman, and so he formed the Maryvale Land and Cattle Company, with holdings both in the Valley and in western Arizona near Parker.[77]

Long's venture into cattle raising illustrates one of the factors that was most affecting the cattle industry in Arizona during and after the 1950s. The cities of the Salt River Valley, and to a lesser degree Tucson, were experiencing unprecedented levels of urban expansion since 1945. Developers bought section after section of agricultural land, subdividing it for new residential and commercial buildings. Cattle feeding operations saw the value of their land soar and took advantage by selling out. Many used the windfall to purchase new land on the further outskirts of the Valley, towards Buckeye to the west and Chandler/Gilbert to the east, where they built new modern facilities. The Northside Hay Mill and Trading Company, provides a good example of this trend. Owners Harry Bonsall, Sr., Harry Bonsall, Jr., and managing partner Olen Dryer, started their custom feeding business, located at 4480 W. Bethany Home Road, in 1947. It was modern—"machines all the way,"—as Dryer put it, and had a capacity of 3,000 head of cattle. In 1957 with the growth of Phoenix and Glendale rapidly approaching, they saw that their future lay elsewhere, so they planned ahead by purchasing 120 acres at Olive Drive and the Agua Fria River, and constructed an even more up-to-date feeding facility, allowing for a smooth business transfer when they sold their property.[78]

Low cattle prices and the booming residential and commercial development that was swelling Phoenix into metropolitan status meant that the value of land was for many ranchers their primary asset. Throughout the 1950s, the rural landscape of alfalfa and cotton fields and citrus orchards gave way section by section to new subdivisions of single-family homes. This meant opportunity either to cash out of the cattle business on favorable terms or the ability to finance a more modern venture elsewhere, as Olen Dryer and partners did with their feedlot business. The most momentous example of such a development came with the announcement in November 1955 that Alan Feeney had leased the land of his Milky Way Ranch to California commercial developer Jerre Strizek, who immediately transformed the pasture of Feeney's nationally famous Hereford stock into the Town & Country Shopping Center. Feeney transferred his ranch headquarters eastward near Scottsdale on Granite Reef Road. For the time being, the new Milky Way Ranch would continue as the state's premier purebred Hereford operation.[79]

[77] Dick Hopper, "The Story of John F. Long," *AS*, November 1956, 12, 39.
[78] Leonard N. Sime, "Feeder of the Month: Olen Dryer," *AS*, May 1957, 12, 43.
[79] *The Arizona Republic*, 17 November 1955; *The Arizona Republic*, 15 January 1956, 5:13; *AS*, December 1956, 21, 82-4. Strizek had built two previous shopping centers using the name Town & Country, which reflected his practice of purchasing land at a distance from the urban center in anticipation of residential development. His venture in Sacramento had also been built on what had been a notable ranch, the former Rancho del Paso where champion race horses had been bred.

Feeney's move is symbolic of the changes caused by rapid urban growth in Maricopa County. It puts into sharp focus an important feature of Arizona ranching. A cattle ranch was not the land on which cattle were grazed. It was a business venture whose identity was tied to its ownership, its brand, and the type of cattle raised. Ranches were mobile and could be transferred easily as their owners bought and sold land. The rancher with an emotional tie to a specific piece of ground—a western version of Scarlett O'Hara's feelings towards her Tara plantation in *Gone With the Wind*—was very rare, and in fact would have been a hindrance to business success.

Although the depressed economy of the 1953 to 1958 period contributed to the slow decline of Maricopa County as the most important region of the state's cattle industry, it did not cause it. Urban development made the shift inevitable. Also, since Maricopa County was so large, the change was not readily apparent. Feed lots and ranches could simply move to outward ahead of the subdivisions as with the case of the Milky Way Ranch. At the same time, expanding irrigation development in Yuma County made that region more attractive. The Bureau of Reclamation's Wellton-Mohawk Project began placing tens of thousands of acres of newly irrigated land into production in the 1950s. Total crop acreage in Yuma County doubled between 1951 and 1956 from 91,014 acres to 181,648. Far removed from urban development and closer to the southern California market, the area was clearly in line to become one of the most important livestock centers in Arizona.

By 1957, Yuma County already had some feed lots, at least 70 with a capacity of over 50 head, but had no large custom feed lots. Sid Turner opened the first, the Mill Iron Cattle Company, in the spring of that year. There were a few ranchers who braved the Yuma heat and established notable ranches. One of these was Floyd Newcomer, an Illinois native, but a resident of Arizona since about 1928. Newcomer took a job with the L. M. McLaren Produce Company in Yuma and eventually became the firm's president. He also decided to go into the cattle business by forming the Yuma Valley Cattle Company, or "Yuvalle," located seven miles southwest of town. His investments in both produce and cattle were complementary as he found that the culls produced by his 4,000 acres of cantaloupes made good feed. A chance accident at his feed operation in 1949 led Newcomer into innovative cattle raising. That year he received two black steers from Texas that drew his attention not only with their color, but also with their unusually alert and curious personalities. Weighing them after slaughter, Newcomer also found that they showed an exceptional weight gain during feeding. Investigating, he found that the pair had been of the Brangus breed, a cross between Brahman and Angus, and that a Brangus association had recently been formed in Oklahoma. With the zeal of a convert he began building a foundation herd of Brangus in 1950. He was helped by the presence of another rancher, Bruce Church, who happened to breed Brahman, which were still an oddity in Arizona. Newcomer and Church swapped Angus and Brahman stock as the both became advocates of the Brangus. In 1956, Church hired Al Face from the UA extension service to take his breeding program to the next level.

As the two most prominent Brangus breeders in Arizona, Newcomer and Face had a friendly competition over the ensuing years at cattle shows and both served as president of the International Brangus Breeders Association.[80]

The Wellton-Mohawk Project was constructed between 1949 and 1957 and first began delivering water in 1952. It was an extension of the Yuma Project, one of the earliest irrigation developments of the Reclamation Service, which put some 130,000 acres into agricultural use during the 1910s and 1920s. Early irrigation efforts along the lower Gila River were begun by homesteaders who formed the Mohawk Valley Canal Company in 1883, and who dug a few miles of canals that tapped the river. The federal government took over the region's irrigation development after the failure of private efforts beginning in 1928 with the authorization of the Gila Project. Extensive work on the Wellton-Mohawk Division of the Gila Project was authorized in 1947 with the goals of reclaiming approximately 75,000 acres, of which less than 8,000 acres were already under cultivation using privately developed wells. Already in 1953 some 21,000 acres were under cultivation. The system today irrigates about 62,000 acres. Area farmers organized a soil conservation district in 1950. The district was greatly expanded in 1958 to include the groundwater-irrigated farms of the Dateland and Hyder region to the east. The principal crops grown there are alfalfa, barley, wheat, Bermuda grass seed, and vegetables. The major customers for these products are dairies and livestock feed lots in California and Arizona. In 1952, prior to the arrival of Colorado River water, only about 1,000 head of cattle lived in the area. It now supports the McElhaney Cattle Company feedlot with a capacity of 100,000 head, one of the three largest feed lots in Arizona and one of the largest in the world.[81]

Most stockmen who achieved prominence among their peers did so through the special attention they gave to some important aspect of ranching work. The breeders of the finest purebred stock were perceived as a step above the common commercial stockman because the care with which they selected and bred had far reaching effects on the herds of ranchers who were their customers for sire bulls. Others were noted for their investments in range management, their experiments creating the models for others to replicate to improve the carrying capacity of the land. The system of livestock shows and competitions in youth

[80] "Yuma Offers Cattle Feeders Cattle-Feed-Climate-Market," *TSM*, January 1958, 36, 39, 41; "Canteloupe Culls Go Into Cattle Feed At Floyd Newcomer's Yuma Valley Cattle Co.," *TSM*, January 1958, 17, 96; "Brangusville U.S.A., " *AS*, May 1964, 8; Dick Schaus, "State Fair Beef Cattle Show Revival Highly Successful," *AC*, October-November 1962, 24-26; "Brangus," *AC*, February 1963, 41.
[81] Scott Thompson and Matthew A. Sterner, *Inventory and Documentation of the Irrigation System of the Wellton-Mohawk Division of the Gila Project*, (Tucson: Statistical Research, Inc., 2005): 5-54; www.wellton-mohawk.org/agriculture.html. There is a McElhaney Cattle Company Museum located at 34673 E. Country Ninth St., Wellton.

organizations such as the Junior Hereford Association celebrated competition and gave recognition and awards to those who excelled in raising calves or promoting beef. Far from being traditionalists, stockmen respected and rewarded the innovators among them who devised solutions to their common problems.

Other ranchers became prominent not so much for their exemplary ranching, but because of their civic participation. Political involvement was one road to prominence. Until the 1960s, membership lists of the Arizona Legislature include a high proportion of ranchers.[82] Examples include Earl J. Platt, Fred J. Fritz, James Smith, and Edward L. Jameson, who were elected to multiple terms, sometimes in both legislative houses.

Another group of ranchers avoided direct participation in electoral politics, but were highly involved in other civic organizations and activities. Three such men, M.O. Best, Frank Snell, and Tom Chauncey were exemplars of the civically involved ranchers. These men were also more urban oriented and participated in extended business and civic activities such as serving on boards of directors of important corporations, businesses, charities, and social organizations. They were also an ephemeral type, disappearing as Arizona modernized and as ranching became less significant as part of a diversified business portfolio. In Arizona today there are very few men or women associated with ranching who have attained the positions of social or civic prominence once held by men such as Best, Snell, and Chauncey.

On 25 September 1955, M.O. Best, one of Arizona's most prominent businessmen and agriculturalists died. Since 1934, he had built up a large cattle business with ranges in Apache County and feeding pastures west of Phoenix. He had served livestock organizations such as the Cattle Feeders Association as a director and was involved in the financial side of the business as one of the investors in the Arizona Stockmens Loan Company. He was also a spokesman for conservative interests opposed to government intervention in the livestock industry through price supports at the beginning of the severe downturn that began in 1953. He was more notable, however, as one of the leading farmers of Arizona and an important civic figure as well. He was born on February 13, 1902 in Arlington, Colorado, where his father was a rancher. After studying agriculture at Colorado A & M, Best moved to Arizona to work for the Stanley Fruit Company, growing vegetables in the Salt River Valley. Within two years he was in business for himself with a farm and packing shed along the Santa Fe Railroad on the outskirts of Phoenix. Realizing the advantage of controlling a year-round supply of produce, he expanded his farming in California's Imperial Valley in 1929. Raising and shipping produce made ice manufacturing a natural investment, which he began in El Central,

[82] This disproportionate representation by ranchers occurred because of the organization of the State Senate membership by county. Rural counties received an equal number of senators as urban counties, despite the difference in their population. This practice ended after a series of Supreme Court rulings in the 1960s established the principle of "one-man, one-vote."

California. Best's involvement in the ice business subsequently led to his later acquisition of Shippers Ice Company of Phoenix in 1945. Although he did not enter electoral politics, he was appointed a regent for the University of Arizona from 1939 to 1947. As he became more prominent in business, he was invited to serve on numerous business boards of directors, including Valley National Bank, the Salt River Valley Water Users Association, and the Central Arizona Project. As chairman of the board of Calapco, the power utility, he spearheaded its merger with Northern Arizona Light and Power Company. As one of the leading businessmen in the state, he was naturally looked to for leadership in civic and charitable organizations. He served on the boards of the Jane Wayland Home, Goodwill Industries, the YMCA, the Phoenix Kiwanis Club, and, of course, the Phoenix Country Club. Following the decline of cattle prices in 1953, Best was the leading opponent of price supports and federal assistance. With his diversified investments, he was in a position to weather the trough of the livestock price cycle. In the coming years, such diversified business investors would play an increasingly important role in Arizona cattle ranching. Very few, however, would step up to play an equally important public role as well.[83]

Frank L. Snell, a Phoenix attorney, was one of the political and economic power brokers in Arizona during the middle decades of the twentieth century. Concerned with all aspects of the state's development, he contributed to the cattle industry by working to make Phoenix a venue for a national livestock competition. He was a native of Kansas City, Missouri, born on December 23, 1899, and a graduate of the University of Kansas law school. Snell arrived in Arizona in 1924, working in Miami for three years before moving to Phoenix. There he developed a variety of business interests to supplement his private law practice in the firm of Snell & Wilmer, where he was responsible for its business and commercial aspects rather than its courtroom representation.[84] In the postwar years he was associated with private investments such as Phoenix Properties with developer Porter Womack, the Bagdad Copper Corporation, Arizona Bancorporation, Allison Steel Manufacturing Company, the Camelback Inn, the American Institute of Foreign Trade, and Arizona Public Service. During the war in a meeting later referred to as "Frank Snell's card-room putsch," he used the occasion of the Army's ban on personnel furloughs into Phoenix to maneuver the ouster of the city manager and his allies. He continued his civic contributions to the end of his life on September 5, 1994.

In the realm of livestock, Snell was prominent as the primary force behind the Arizona National Livestock Show. In 1948, perceiving the success of Tucson's livestock show, Snell gained the backing of

[83] "Cattle Feeder Association Director Elected to Valley Bank Board," *AS*, February 1948, 26; *The Arizona Republic*, 26 September 1955, 1. In 1961, APS developed a small park in Best's memory and donated it to the City of Phoenix, located at 2nd and Roosevelt Streets.
[84] Snell & Wilmer's most important case was *Arizona v. California* in which the U.S. Supreme Court ruled in favor of Arizona's claims on Colorado River water.

other Phoenix movers and shakers such as William Wayland, Ben Projan, J. Howard Pyle, Robert C. Hall, and Frank Brophy for his plan to create a national livestock show in Phoenix. The first show was held in December 1948 and continued under Snell's direct supervision until 1958, by which time it had become one of the major venues for livestock display in the country.[85]

A third example of important Arizona business leaders and cattlemen is Tom Chauncey. Chauncy arrived in Phoenix in 1926 at the age of thirteen with his older brother. Amongst the later leading citizens of Phoenix, Chauncey's entrance to his new community was perhaps the least propitious—they had jumped a ride on a freight train after running away from their home in Dallas, Texas. Despite a lack of experience, Chauncy obtained a job with a local jeweler. He was an audacious hard worker with hardly any assets opened a jewelry store of his own. The business proved successful and with his gregarious personality, Chauncey was soon making friends and acquaintances among the leading businessmen of the city, such as Phil Tovrea. Chauncy served on the Arizona Motion Picture Commission for several decades, enticing Hollywood studies to film movies in the state and assisting in their productions in ways such as location of filming sites and obtaining local extras and props, such as cattle and horses for westerns. He made numerous contacts with important people in the film world, including Bing Crosby, who became a close friend of the Chauncey family. His most important businesses were in the media, television and radio stations with statewide coverage like KOOL-TV. He was partner in these ventures for many years with cowboy film star Gene Autry. Chauncey's investments in ranches began in 1960 with the purchase of the 4,000-acre H Lazy A near Mayer, which was noted primarily for its prize Arabian horses and for its beautiful meadow along the Agua Fria River. He later donated this property to the YMCA for use as a summer camp. He subsequently purchased the world-famous 26 Bar Ranch, previously owned by John Wayne, which was the former northern branch of Alan Feeney's Milky Way Hereford Ranch. He purchased two properties of some 160,000 acres south of Winslow called the East Clear Creek Ranch and the West Clear Creek Ranches, both among the top cattle ranges in the state. He died in 1996 at the age of 83.[86]

[85] Biographical Note, The Frank L. Snell Collection, Arizona Historical Foundation; *Arizona Republic*, 26 March 1947, 1:2; *Arizona Republic*, 22 December 1957, 5:8; *AC*, "Frank L. Snell," November 1966, 8; *Arizona Republic*, 16 January 1972, B-1; Dennis Preisler, "Phoenix, Arizona During the 1940s: A Decade of Change," (Master's Thesis, Tempe: Arizona State University, 1992): 24; *The Arizona Republic*, 21 February 1954, 1:2; Judith Anne Jacobson, "The Phoenix Chamber of Commerce: A Case Study of Economic Development in Central Arizona (Master's Thesis, Tempe: Arizona State University, 1992): 20; "Thirteen Years Old—Still Growing," *AS*, December 1960, 9.

[86] Tom Chauncey, *Tom Chauncey: A Memoir by Tom Chauncey* (as told to Gordon A. Sabine), (Tempe: Arizona State University Libraries, 1989): 1, 10-11, 21-22, 43-44, 178-80; "Valley magnate Tom Chauncey dead at 83," *The Arizona Republic*, 28 June 1996, A1, A14; Dorothy Polson, "Holiday Week at the Ranch," *The Arizona Republic*, 27 December 1963, 33, 36.; "Faded glitz of Arabian nights, days," *The Arizona Republic*, 21, January 2001, F1. Twice married, his second wife chewing-gum heiress Dorothy Wrigley Rich, Chauncey accumulated children, grandchildren, and an ever increasing wealth and power. Along with men like Snell and newspaper publisher Eugene Pullium, Chauncey was a

==========

Rationalizing the Ranch, 1958-1970

Ironically, one outcome to the decades-long effort of cattlemen to assure themselves of favorable tax treatment at both the federal and state levels was to make their properties targets for large-scale investors who may or may not have had any knowledge or interest in the work of cattle raising. People in high income tax brackets saved money by investing in a cattle ranch and improving its property and stock, even if cattle were sold at a loss since the property could later be sold and the increased value received treated as a capital gain, which had a lower tax rate.[87] This meant immediate windfall gains to those who sold off their increasingly valuable land. It also made it increasingly difficult for newcomers to get started in the business as it required ever greater initial capital investment. During the frontier era, there had been many vast ranches operated by investment syndicates, but these had not been notably successful. A cowboy of that time might become a rancher in his own right with no more capital than a branding iron with which to mark any stray cattle that he came across. Ranching in the mid-twentieth century, in contrast, was rarely to be considered except by those raised to the task, usually sons in ranching families who obtained college degrees in animal husbandry, who could either inherit land, cattle, and equipment, or who could participate as managing partners or simply employees for investment groups. Only investors who could bring to the table hundreds of thousands, even millions of dollars, could consider starting a new large-scale ranching venture with modern equipment, registered animals, diversified land use, and knowledgeable management.

While investors in search of tax shelters came from all parts of the economy, Hollywood provided the most glamorous set. When Arthur Loew, Jr., scion of the film and theater family, spent $8.5 million for the 20,000-acre Baboquivari Cattle Company in Pima County in March 1957, every land-owning rancher in Arizona took notice. Husband and wife stars Stewart Granger and Jean Simmons owned ranches near Nogales and in New Mexico.[88] The division of the old Otero Ranch near Tubac brought in entertainment

founder of the Phoenix 40, and one of the major powerbrokers in community. In 1960 he was appointed by President Eisenhower as ambassador to Nigeria and later was responsible for giving singer Wayne Newton his big break in show business. He and Anne McCormick, another Arabian horse breeder, formed the Scottsdale Arabian Show in 1955. Not all aspects of his life were so charmed however. After a break with Gene Autry, he was forced to give up control of his television station, and he went through a bitter divorce from Dorothy. His children were forced to dispose of his cattle holdings following his death in order to pay the inheritance tax. His son, Tom Chauncey, Jr., continues to this day to raise prize Arabians, although the family's ranch on north Scottsdale Road has given way to upscale commercial development.

[87] "Sideline Ranching Should be Taxed," *TSM*, December 1963, 11.

[88] Loew entered the ranching business with an experience partner, Gerald Palmer of Tolleson who had been superintendent of the Salt River Valley operations of the Cowden Livestock Company. "Old Arizona Ranch, Changes Hands," *AS*, June 1957, 30; "The Stewart Grangers Sell New Mexico Ranch," *AS*, January 1959, 55.

figures such as singer/actor Bing Crosby and Will Rogers, Jr., actor and son of the famous cowboy humorist. Both purchased approximately quarter-sections of land, though perhaps their interests were directed more towards the aspiring social scene that was trying to take root around Tubac. Crosby, for example, was also an early member of the Tubac Country Club. But the most famous singer of his time also had other ranching investments such as a 30,000-acre spread in Nevada, which he sold in early 1959 before beginning to invest seriously in Arizona. In February 1960, the board of the First National Bank of Holbrook, which included several prominent northern Arizona business and agricultural figures, elected Crosby their chairman. This decision was not for publicity, but because he was making major investments and boosting the region.[89]

There was no star for who a cattle ranch tax shelter was more appropriate than John Wayne. In 1958, Wayne, on the advice of his tax accountant, purchased 4,000 acres of cotton land near Stanfield, west of Casa Grande. Knowing nothing about raising cotton, he became partners with Louis Johnson, owner of a neighboring farm. At the Duke's suggestion, they combined operations. Johnson provided the agricultural know-how and Wayne the deep pockets that could sustain major investments. Johnson was equally adept at managing cattle and with enthusiastic backing of the most famous cowboy of Hollywood, in 1963 he purchased the old 5,000-acre Milky Way Ranch near Springerville and eventually consolidated fourteen other properties into their 64,000-acre 26 Bar Ranch. Wayne's money allowed Johnson to develop a purebred Hereford herd that consistently won national championships over the ensuing two decades, a fitting successor to Alan Feeney's earlier operation. Wayne professed to take the operation seriously and not just as a hobby. "I feel about Herefords just like I do my other business," he said. "To make a profit, you have to invest in a quality product and hire efficient management to produce and sell the results." Tours and cattle sales held at the 26 Bar were always popular, with Wayne often attending and greeting his visitors. The aura of the Duke remains to this day. The 26 Bar Ranch is now one of several properties near the White Mountains owned by the Hopi Tribe and its old ranch headquarters is a bed & breakfast and museum. Visitors in late May can take in the annual John Wayne Days parade and celebration in Springerville.[90]

The economic rationalization of industrial ranching demanded further modifications of cattle wherever technology and science offered an opportunity to create a more marketable animal. Researchers continuously explored ways to maximize the role of the sire bull. In purebred lines, the bull played a more significant role than cows because it was easier to limit genetic variation by only allowing cows to

[89] "Will Rogers Jr. Buys Arizona Ranch Home," *AS*, October 1958, 61; "Crosby Sells Nevada Ranch," *AS*, January 1959, 10; "Bing Crosby Buys Arizona Property," *AS*, June 1959, 39.
[90] "Denver Sales Topper Comes to New Home," *AC*, March 1966, 7-12; "26 Bar Ranch Hosts Juniors, *AC*, September 1966, 22, 24; 26 Bar Ranch information at http://www.26barranch.com.

reproduce with a selected set of bulls. Most Arizona ranches through the 1950s relied mainly on the traditional practice of setting a limited number of bulls on the range where they could be expected to naturally impregnate a certain number of cows. Since well-bred bulls were increasingly expensive there was always an incentive to economize and it became impractical to simply allow bulls to roam where they were subject to potential loss by natural hazards. On ranches with increasingly well regulated pasture systems, bulls tended to be kept close in order to facilitate the maximum number of mating opportunities. But since a bull might only service 25 to 30 cows annually naturally, means were sought to increase its capacity.

Jack LeForce (left), cattle manager of the 26 Bar Ranch, with owners Louis Johnson, Ken Reafsnyder, and John Wayne, 1966. *Arizona Cattlelog*, March 1966, p. 8.

An example of such economically driven measures to improve the efficiency of bulls was the Luckett Angus Farm ranch of Alvin Luckett, Sr. and his son Alvin, Jr., located on 1,200 acres near Marana. Their small herd consistented entirely of cows except for a single prize-winning bull. The Lucketts were among the first Arizona ranchers to employ technology to enhance their bull's ability to inseminate to well over a hundred cows by use of an electro-ejaculator. Artificial insemination offered the promise of limiting reproduction to only the finest bulls and might eventually eliminate the role of the range bull altogether. Further developments using frozen semen on an open market could eliminate the necessity for a rancher to own any bulls at all. The limiting factor in this trend was the high cost. Researchers also sought ways to

modify the role of cows. During the 1960s, it was found possible, although not economically viable, to use cows simply as incubators for the implanted embryos of only the most select type of cattle.[91]

The selection of the best breed of cattle was an industry obsession throughout the 1950s. Despite the overwhelming dominance of Hereford cattle throughout Arizona, there were a growing number of ranchers at least willing to try competing breeds. An important reason for this was the relative stagnation in characteristic improvements being obtained through traditional selective breeding. Early in the century, common cattle grew at a relatively slow pace. One of the achievements of selective breeding had been to accelerate the rate of maturation to produce a marketable animal at an earlier age, thus reducing the cost of feeding over its lifetime. In the postwar era, commercial cattle achieved smaller gains despite continuous experiments by private breeders and university programs. Genetics were the limiting factor. Purebred lines ultimately limited the genetic variation available for breeders to manipulate. By the 1960s, dedication to purebreds gave way to selective cross-breeding in order to restore a "hybrid vigor." In some cases this led to the creation of newly recognized breeds such as the Brangus and the Charbray. In Arizona, Francis Norwood Bard of the Bard-Kirkland Ranch began breeding experiments with cattle geneticist E.S. "Jack" Humphrey. The result was a new breed dubbed Barzona, which was a cross of Santa Gertrudis, which was itself a Brahman-Shorthorn cross, and Afrikander, Hereford, and Angus. Bard and Humphrey were seeking a relatively drought-resistant animal, a characteristic of obvious benefit to Arizona stockmen. They settled on the Barzona as it showed an apparently faster rate of weight gain that the Santa Gertrudis. Bard led the formation of the Barzona Breeders Association in 1968.[92]

At the same time that some cattle raisers were focused on improvement through cross-breeding, the feeders were evolving into a major component of the meat marketing structure. In addition to the marketing advantages they offered, the feeding establishments were premised on the desirability of intensive feeding with a variety of feed ingredients and supplements in order to maximize weight immediately prior to final sale for slaughter. In these years of increasing beef demand, animal weight was the primary consideration although it was slowly recognized that it could not be the sole consideration. Even in the 1950s, there was a concern about the fat content of beef versus poultry. However, not until the late 1970s would a noticeable market shift in favor of the latter occur. By the early 1960s, cattlemen were becoming aware that they had

[91] Len Sime, "Modern Stockman Must Be Ready to Try New Methods for Progress," *AS*, May 1956, 11, 27; "Artificial Breeding For Beef Herds Now Termed Practical," *TSM*, March 1960, 35, 40; Stewart H. Fowler, "Only Scratched The Surface In Research," *TSM*, June 1960, 9, 17.
[92] Lowell S. Patterson, "Barzona Cattle Are Bred Especially For Intermountain Area," *TSM*, Jan 1958, 21. F.N. Bard (1882-1970) was a wealthy manufacturer from the East. After his death, his widow continued the ranch until 1973, when its herd was dispersed to a few aficionados who wanted to preserve the breed ("Cornell University Dedicates Bard Hall," *AC*, February 1964, 20-24; Additional biographic information http://benttreefarms.com/SouthPoll/Bbreed.html).

better begin looking at how their animals put on weight and not just at the number on the scale. Some cattle put on fat within their muscles (desirable) while others simply stacked fat on top, leaving the packers or the cooks to trim away the waste. One commentator noted that packers routinely cut away millions of pounds of tallow annually, much of which became an ingredient in chicken feed, which then reappeared as cheaper broilers in competition with beef. Reducing undesirable fat became an important research agenda.[93]

In the late 1950s, a new industry paradigm—Performance Testing—began spreading across the West which promoted a more holistic approach to livestock management. The Performance Testing movement was born of the economic difficulties facing ranchers during the mid-1950s. Performance Testing considered all the factors that contributed to the quantity and quality of the beef ultimately marketed. This meant reconsidering the role of breeding, feeding, and business management. The movement's chief advocate was Performance Registry International (PRI), a Denver-based organization that in 1955 promoted national standards on the rate of weight gain for all cattle breeds. These standards were designed to identify the top third of all performance tested animals. PRI worked in cooperation with a widening number of local Beef Cattle Improvement Associations around the West. The registry concept greatly emphasized improved record-keeping on all traits throughout the animal's life and moved cattlemen into the just-them emerging field of electronic data storage and analysis. PRI issued certificates of performance on animal in their registry and provided IBM forms with information on the performance of the calves, cow herd, and herd sires throughout their productive years. The motivation was that such information would allow more selective culling of both cows and bulls, and might even be used to select the optimal mating pairs based on their joint performance. PRI and allied organizations such as agricultural experiment stations, had to convince ranchers to participate in a gigantic data-gathering effort. It was a difficult sell at first, but began to spread rapidly in the early 1960s. Harold Thurber, one of the two most prominent Hereford raisers in Arizona was the first in the state to place his entire herd in the Performance Registry International in 1962. The University of Arizona initiated a Beef Cattle Improvement Station that year to perform tests on bulls of all breeds. As the movement widened, PRI expanded its program to include standards issued in 1962 for defining superior carcasses and awards for certified meat sires in 1963. The American Hereford Association joined the movement in 1964 with its own system of recording performance in its purebred registry.[94]

Performance Testing was an important step in the evolution of the cattle business towards rationalized industrial methods, a sort of Taylorism or scientific management similar to that applied in industrial

[93] Glenn Butts, "Role of the Association in Beef Cattle Improvement," *TSM*, November 1962, 13, 24-7.
[94] Jerry Litton, "Performance Testing A Must For Purebred Breeders," *TSM*, January 1963, 15, 17; Farrington R. Carpenter, "Why Limit Performance Comparison?" *TSM*, June 1963, 18-19; "Thurber Herd Joins PRI," *TSM*, October 1962, 22; "77 Bulls On Ariz. Test," *TSM*, November 1962, 15; "PRI Certifies Second Meat Sire," *TSM*, March 1963, 15.

factories.[95] The registry movement occurred at the same time that the meatpacking sector was undergoing profound changes such as the abandonment of Chicago as a packing center in favor of more dispersed locations closer to the sources of supply and cheaper labor. New firms like Iowa Beef Packers (IBP, now a division of Tyson) were challenging the positions of the older packers with innovative marketing techniques. Also, the expanding interstate highway system was giving truck transportation a decisive competitive advantage over railroads, which Western cattlemen believed had long disadvantaged them with discriminatory freight rates. Future developments would include great advances in biotechnology.

After the Second World War, it was generally acknowledged that range conditions throughout Arizona had been seriously degraded over the previous century and that overgrazing had been an important contributing factor. This deterioration is described in detail in the associated MPDF *Cattle Ranching in Arizona, 1540-1950*. To summarize this development here, it need only be noted that once abundant grasses had been stripped from many ranges around the state, their place taken by invasive species of less valuable plants such as juniper, cholla, and piñon pine. Also, removal of protective grass cover exposed soil to accelerated erosion. Deep gullying in formerly meandering creeks demonstrated the devastating effects of flash floods now unchecked by plant cover. Nature had provided an infrequent and inadequate check on overgrazing through occasional devastating droughts that desiccated the land and destroyed countless head of cattle and the livelihoods of many ranchers. The idea of simply removing excessive numbers of cattle from the range ran headlong into opposition from cattlemen who defended their rights to raise as many cattle as possible, even on public lands.

Through the first half of the twentieth century, important precedents were established on the regulation of cattle on federal and state land and a system of permits limiting the number of cattle grazing was firmly established by the beginning of the postwar period. The permit system itself, however, could not prevent the adverse effects of grazing even in areas where limitations in numbers were achieved. The problem extended beyond simply the number of animals. Cattle tended to congregate in areas where water was available and so their deleterious impact on the land were concentrated.[96]

To affect a change in soil conservation and range improvement, public land managers, educational institutions, and cooperating ranchers pursued a two-prong strategy. The first aspect of range improvement strategy was to improve the grazing capacity of the land through engineering and capital investment. Ranchers had been following this strategy for several decades, which included water development such as

[95] Performance records remain important to cattle raisers today. SeeThomas (1998).
[96] Interested readers may find more on land erosion in Arizona in Conrad Joseph Bahre's *A Legacy of Change: Historic Human Impact on Vegetation of the Arizona Borderlands*. (Tucson: University of Arizona Press, 1991).

wells and stock tanks to retain water in areas where cattle could not otherwise graze. Stock tank development accelerated after the 1920s when heavy earth-moving machinery became available. These strategies greatly decreased the effects of periodic dry spells, but were expensive and required maintenance. Furthermore, farm and (later) urban-oriented organizations like the Salt River Valley Water Users Association, who had a vested interest in watershed management and who maintained extensive claims on runoff water, watched to ensure that ranchers did not divert more water for cattle than was their right.[97]

Improvements on private land were not controversial, but improvements on public land became an increasing source of contention as newly empowered interest groups such as recreationists and environmentalists challenged the cattlemen's vested interest. In the early years of federal land management there had been an emphasis on defining the land's highest and best use, which did not conflict with cattle grazing as long as the land was perceived to have no better economic alternative. After 1945, cattlemen found their right to graze challenged by environmental critics. Although the Western livestock industry achieved a notable legislative victory in the Multiple Use Sustained Yield Act of 1960 which directed federal land agencies to balance competing uses of the public domain, there was an obvious long-term trend towards greater competition between grazing and other uses.

Arizona ranchers depended on public lands for grazing and so had to cooperate with federal and state agencies to undertake improvements such as construction of fences, roads, and stock tanks. Much of the improvement was paid for by the ranchers themselves, which explains their determination to secure long-term use permits. The federal agencies also paid directly from certain improvement projects, although the funds for these usually came from permit fees paid by the ranchers. In 1962, the BLM conducted an inventory of range improvements under its jurisdiction and calculated their replacement value. The total of some $9,615,000 in improvements included dams, pipelines, fencing, wells, cattle guards, and numerous other constructions that made the public's land usable for livestock (see Table 2). Those built by ranchers totaled $5,689,400 with the rest contributed by the BLM using fees paid by the stockmen's permits.[98]

[97] Dick Schaus, "Tall Pines Farm Bureau Tours Coconino," *AC*, September 1962, 18-24.
[98] "Arizona Ranchers Spend $5 Million on Public Ranges," *AC*, December 1962, 56-59.

==========

Table 2: Rangeland Improvements Under BLM Jurisdiction

Type	Rancher-installed	BLM-installed
Brush control	2,129 acres	135,972 acres
Deep tillage	0	814 acres
Fencing	1,905 miles	3,576 miles
Seeding	228 acres	69,098 acres
Detention dams	0	61
Dikes	28,535 linear feet	368,734 linear feet
Pipelines	1,411,519 linear feet	60,928 linear feet
Reservoirs	1,064	115
Spring developments	315	23
Water storage facilities	199	10
Wells	330	50
Cattleguards	5	135
Corrals	332	45
Study plots	0	14
Truck trails	126	102
Stock trails	50	51

Ralph Cowan's ranch in Sulphur Springs Valley was one of the earliest to implement major range infrastructure improvements to halt severe erosion. Cowan was the son of a pioneer southeastern Arizona rancher and by the time he was managing his own outfit the land was showing signs of serious erosion. By the 1930s, one particular creek had developed into a large gully that was eroding at a pace of approximately 500 feet per year and already extended some nine miles. To halt the erosion, Cowan built a sixty-foot concrete spillway across the gully at a cost of $13,000. While this was effective in halting the upward cutting of the streambed, there was already five square miles of land below the spillway denuded of grass as a result of flooding. To restore this land, Cowan constructed contour dikes, reported to resemble a maze of earth and silt scraped up to divert the flow of water and create a series of basins. Over the years, grass began to grow in these basins and the land noticeably improved. Cowan was acknowledged in livestock journals to be a leader among private conservationists. His big "F" outfit ran fewer cattle than other ranchers raised on similar ranges and his extensive fencing defined forty separate pastures, each with its own windmill and

tanks, which kept cattle from harmful concentration at watering places. He matched this investment in the land with improvements to his livestock and utility buildings.[99]

Two ranchers, Henry Day and Ted Lee, exemplified the forward-thinking rancher of the 1950s and 1960s who invested capital in the improvement of their range through control of erosion. Henry Day's Lazy B Ranch contained about 160,000 acres on both sides of the Arizona-New Mexico border and, like many ranches dating back to the nineteenth century, required a great deal of remediation for the land to remain fertile. Although born in Arizona, Day had been raised largely in Pasadena, California, in order to obtain a better education, but returned to manage the ranch following the death of his father in 1921. The process of ranch improvement began with upgrading his herd's breeding by importing a number of Hereford bulls. Paying careful attention to costs and avoiding debt, he weathered the depression years. A journalist reported of his ranching skills that he had a "green thumb and rode a desk like mad." His son Alan, born in 1939, took up ranching and by the 1960s was largely managing the Lazy B. At the suggestion of the local BLM official promoting soil conservation on the ranch's public land, Henry constructed a network of flood control dams and flood water spreaders on all of the ranch's major canyons and washes. Their improvements were followed by widespread reseeding. By the mid-1960s, a part of the ranch known as the Railroad Wash Conservation Area became a model soil conservation area and a stop on tours arranged by the State Department for foreign visitors studying American soil management techniques.[100]

The other exemplary conservationist rancher was David Turner "Ted" Lee. Lee's cattle carried the RL brand which dated back to 1813 when it was first registered in Illinois by an uncle of his ancestor John D. Lee. The family moved west, settling for a time in New Mexico, before moving to Thatcher in 1900. Ted's father, Marion Lee, and later Ted himself, ranched in various parts of Graham County. By the 1960s, their outfit was centered west of Thatcher along the road to Aravaipa. Ted was a veteran of World War II and a graduate of the University of Arizona in 1948. He took over the ranch following his father's death in 1957 and accelerated its modernization. He acquired new land and added purebred Herefords to improve the herd. Along Cottonwood Canyon, over a period of ten years, the Lees built four dams at one to one-quarter-mile intervals. These filled, intentionally, with sediment within a couple of years. The accumulated sediment protected water from evaporation, creating permanent reservoirs. Where the streambed had previously been dry most of the time, it thereafter ran in a small, though continuous, stream throughout the year.[101]

[99] "Three Generations of Conservationists," *AS*, January 1953, 14-15.
[100] Richard G. Schaus, "Harry Alfred Day, 1898-," *AC*, September 1967, back cover, 40. Henry Day was the father of Supreme Court Justice Sandra Day O'Connor, who grew up on the Lazy B Ranch. See Sandra Day O'Connor and H. Alan Day, *Lazy B: Growing Up on a Cattle Ranch in the American Southwest*, (New York: Random House, 2002).
[101] Richard G. Schaus, "Ted Lee, President Arizona Cattle Growers Assoc.," *AC*, July 1966, 6-15..

Management of the public domain required cooperation between private ranchers, government officials, and educational institutions. For many years their emphasis was on experiments and demonstration projects to convince ranches of the efficacy of new management systems. The spread of mesquite over former grass land in the southern part of the state, for instance, was an important issue and several projects compared the results of different removal methods. For example, aerial spraying of herbicides to kill mesquite and burrowweed, followed by reseeding was tested on the Rancho Sacatal and Stansberry Ranch in Cochise County in 1953. To further the effort, the American Society of Range Management sponsored tours of demonstration areas and discussed the results of experimental range methods such as burning and use of chemicals and heavy equipment to remove nonproductive brush.

The society also recognized and awarded innovators in range management, like Carl "Dutch" Webb, who received the Society's award in 1965. Webb managed the JI Ranch west of Miami in a region of boulder-strewn ranges and canyons. He began in 1946 as a partner with his father, Cone Webb, and then continued alone after 1963. A graduate of the university, he had taught himself range management by studying the grassland utilization reports of the Forest Service and Soil Conservation Service. In cooperation with these agencies, he developed and implemented a grazing rotation program for the JI. Furthermore, he took a lead in promoting better range management practices during two terms as president of the Gila Cattle Growers Association and as a supervisor of the SCS at Winkelman.[102]

Early programs in range management were hindered by legal restrictions in the early 1950s. In 1951, Milton D. "Bud" Webb purchased the One Slash One Ranch, a 13,000-acre spread about twenty miles west of Prescott. It had been heavily grazed and Webb, a progressive rancher and former president of the Arizona Cattle Growers' Association, tried to arrange a cooperative agreement with the Triangle Soil Conservation District, only to find that the law excluded ranges. Rancher influence of the State Legislature paid off and the law was changed in 1954, allowing the district to cooperate with Webb. Henry E. Wall, Jr., a range conservationist with the Soil Conservation Service worked with Webb to devise a rotation system so that no pasture would be grazed at the same time of year in successive years. Webb put the plan into practice and by 1960 acknowledged that it was having a positive effect. "Shucks, we never had any grass on the ranch until Hank Wall started coming down," he said, crediting the work of the SCS scientist. "We are managing for grass now. It pays… management is more important than erosion control to get grasses to grow."[103]

[102] "Getting Brush Off the Range is Study Issue," *AS*, August 1952, 11; "Group Inspects Reseeded Rancho Sacatal Lands During Range Management Meeting," *AS*, February 1953, 44, 47; Richard G. Schaus, "Carl Webb Named "Rancher of the Year"," *AC*, February 1965, 22-23.
[103] John D. Freeman, "Yavapai Rancher Pleased with His Range Conservation Plan," *AC*, June 1960, 30-36.

The concept of a rancher's business as raising grass was an important change in the mindset of Arizona ranchers in the mid-twentieth century. It marked the end of the pioneer stockmen's attitude that land should be exploited to its maximum potential for immediate profit. Harbon Heap expressed a similar change in perspective as a result of how his revised grazing rotation system led to a visible increase in cattle output. Heap was a third generation rancher and descendant of Mormon pioneers. His V Bar Triangle Ranch, located about seven miles northwest of St. Johns and watered by the Little Colorado and Zuni Rivers and Carrizon and Big Hollow Washes, had been in the Heap family since 1910. He had a different attitude towards ranching than his father and grandfather. "The land patterns have been set," he told a meeting of northern Arizona cattlemen at Window Rock in 1961. "The open ranges have been fenced in and allotments made, so now it is not how many cattle we run; it's how much beef we put out!" He claimed that after he inherited his father's herd, he reduced its number by nearly a third and in only three years had increased his beef production by thirty percent. "A cowman is nothing but a grass farmer," he said, echoing Webb. The grass management plan prepared with the help of the Soil Conservation Service range conservationist included a three-year, three-pasture rotation for his cow herd and a three-year, four-pasture plan for his yearling heifers. The system allowed each pasture to receive a full rest during the spring during two out of every three years. An active member of his church with a wife and five children, Heaps did not find it difficult to reconcile his range practices with his faith. "We must recognize that we as men are stewards of God's land," he said.[104]

Juniper threatened rangeland in the northern part of the state just as mesquite threatened it in the southern. It grew quickly and by the 1940s was covering hundreds of thousands of acres of former grass land. The problem of overgrowth resulted from a policy of fire suppression, which had allowed the seedlings to survive where once they had been limited by periodic wildfires. Starting around 1950, cattlemen and federal officials began serious efforts to remove juniper. The method of removal typically utilized two large tractors spaced approximately 100 feet apart, pulling a two-inch cable across the ground to tear out the trees. But while this was effective for larger trees, the cable passed harmlessly over young trees. Even though hundreds of thousands of acres were cabled, within a few years the juniper was again densely growing. The only feasible alternative was controlled burning, which some ranchers advocated, but others opposed, fearing a layer of ash might hinder grass growth.

Rancher Joe Arnold in 1955 decided to experiment with burning on his Bar T Bar Ranch about thirty miles southwest of Winslow and found that grass grew quite well in burned areas, which led advocates to

[104] Danny Freeman, "On the Same Range Fifty Years of Heaps," *AC*, September 1960, 42-43; Dick Schaus, "Navajo Cattlemen Hole 1st Convention," *AC*, April 1961, 30-33.

suggest larger test areas. Initially lacking Forest Service cooperation, they selected a section of private land surrounded by National Forest for a controlled burn in 1961. Although the area had been cabled in 1958, young Junipers were rapidly returning. Three ranchers, Bill Ogilvie, Bus Click, and Ernest Chilsom, burned the area between April and July, then reseeded it with wheatgrass and clover. Impressed by the results, the Forest Service agreed to participate in a cooperative burn experiment over 12,500 acres of private and National Forest land, which had also been previously cabled. Called the Red Hill Project, the experiment included testing different types of grass seed. Although not all grasses took equally well, the project was an overall success and by 1964 it was reported that the carrying capacity of the area was likely to be increased from one hundred acres per cow to a more intensive twenty acres per cow.[105]

Range improvement projects occurred on reservations as well. On the desolate deserts of the Hualapai Reservation, degraded tracts of land as large as 10,000 acres could carry less than one hundred cattle. Range conservationist Bill Schroeder claimed that piñon pine had been spreading so quickly that cattle raising would have become nearly impossible on the reservation. In 1954, taking advantage of a large area burned over the previous year, a 14,000-acre parcel was reseeded and then restricted from grazing for the next three years. The carrying capacity of the area increased from about 180 head to 1,000 head. In the early 1960s, the Bureau of Indian Affairs conducted a burn and reseeding experiment on a ten thousand-acre area, reseeded it, and in the summer of 1962 put over 1,500 head of cattle on the new grass. The agency planned similar projects on 100,000 acres over the next few years. At the same time, the BIA and the Tribe pursued water development improvements to complement the range projects. They developed Frazier Well, on the eastern side of the reservation, which produced twenty gallons per minute and was one of the few water sources south of the Grand Canyon. To take advantage of runoff, they built a tank below a hill that had been covered by a half-acre of roofing paper.[106]

Range conditions on the Fort Apache Reservation were similar to those at Hualapai. As early as 1938, the BIA had documented the need to fight back against spreading juniper, cedar, and pine. “If nothing had been done,” said Superintendent Robert Robinson in 1964, “this area would be out of use by now.” Although some work was done beginning in 1939, not until after the war could the problem be seriously addressed. The largest effort began in the late 1950s in what was referred to as a massive “vegetative manipulation” of a tract of 210,000 acres in the Cibecue watershed. By 1964, the Apaches had cleared

[105] Ernest W. Chilsom, "Increasing Livestock Production Through Juniper Control," *AC*, October 1964, 12-15, 18-20, 22. Chilsom was a progressive rancher in many regards. In addition to his support of important range improvement experiments, he also undertook a major improvement of his herd in the 1960s ("Northern Arizona Hereford Tour," *AC*, September 1967, 26, 28, 30-32, 34).
[106] Dick Schaus, "Range Improvements on the Hualapai," *AC*, June 1964, 14-18; Dick Schaus, "Arizona Watershed Symposium Celebrates 5th Birthday," *AC*, 46, 48-49.

37,000 acres of juniper and piñon, 18,000 acres of chaparral, and conducted prescribed burns over another 58,000 acres, which they subsequently reseeded with grass. At the same time, cottonwood and sycamore trees were removed from along creeks and other water improvement projects were undertaken.[107]

Despite limits on the number of cattle grazing on public land, and the increased carrying capacity resulting from range improvements, severe erosion problems remained. A few ranchers, some enthusiastically, others under pressure from federal officials, agreed to participate in demonstration projects to test how different methods of range use affected the land's carrying capacity. These demonstration projects might occur on the rancher's own property in cooperation with the county extension services and with government agencies such as the Soil Conservation Service. In a 1948 project, Harold B. Thurber, one of the top purebred Hereford ranchers in southern Arizona, set aside a fenced 14-acre plot that was studied by the Pima County agricultural agent, the SCS, and the Southwest Experimental Station. In the late 1950s, the Forest Service began testing a new "Deferred-Rest-Rotation-Grazing" management system for perennial bunch grass on fourteen ranches in the Coconino National Forest. For the K Bar T Ranch, managed by Hilda Sullivan, the Forest Service began with an allotment analysis to determine its maximum sustained yield. The plan also included grass seeding and new fencing constructed on a cost-share basis. This experiment, however, did not seem immediately successful. By 1962, steers that Sullivan placed on her allotment gained thirty pounds less than the average of the previous four years. Kenneth Wingfield, who held an allotment at Turkey Mountain also had a rest-rotation plan and furthermore was required to place several thousand dollars of range improvements such as shipping corrals, tanks, fences, and labor to move his cattle. He was also disappointed by the limited gains, as was a touring banker, who warned that such poor investments would have an adverse effect on the ranch's credit rating. Still, during the 1960s, federal land managers continued requiring permit holders to adopt allotment management plans. Over time, these demonstration projects eventually proved effective.[108]

The environmental movement spread widely during the 1960s as the public, especially the urban public, expressed concern over the loss of species, the impact of pesticides like DDT, and the quality of the air and water. Ranchers, who for years had encouraged programs of predator eradication, were now perceived as villains destroying the natural balance of the environment. Popular writers like Edward Abbey made cattle on the range seem like a force of destruction, while Rachel Carson would stir fear of the effects of pesticides unleashed in uncontrolled quantities in the environment. Ranchers spoke of the economic losses that

[107] Dick Schaus, "White Mountain Apaches Host Cattle Growers' Tour of Cibecue Watershed," *AC*, August 1964, 16-18.
[108] "Thurbers Range Raised Herefords," *AS*, May 1952, 16-17; Dick Schaus, "Tall Pines Farm Bureau Tours Coconino," *AC*, September 1962, 18-24; Ralph Rasmussen, "Bureau of Land Management Policies and the Livestock Industry," *AC*, October 1968, 7-10.

suffered as a result of wolves, coyotes, and bears and argued that without pesticides, modern agriculture and the abundant cheap food the public enjoyed would not be possible. Increasingly, the ranchers were dismissed as self-serving and dangerous. The cowboy legend and its link to American tradition no longer seemed to protect ranchers from criticism. Even their product—beef—came under increasing criticism as too expensive, too fatty, and inhumane. Stockmen watched warily as food processors introduced new "meatless meats" to test the consumer's loyalty to beef.

Among the early environmental legislative proposals was a wilderness bill to promote designation of critical habitat areas. Ranchers had won an important land policy victory in the Multiple-Use legislation of 1960, but they actively fought against efforts to "lock up" additional public land for the benefit of wildlife. Neither, they argued, were they enemies of wildlife. They pointed to the beneficial effects that development of such range improvements as stock tanks had for other species. They argued that public lands must be valued for their potential economic use. This argument, however, was increasingly unpersuasive and in 1964, Congress passed the Wilderness Act. The act did not mandate the immediate removal of grazing from designated areas, but it greatly restricted any further development of that use.

Once the act passed, cattlemen realized that obstinate opposition to all wilderness proposals was unlikely to succeed. It was reasonable, they argued, to examine each proposal on its own merits. For example, the Arizona Cattle Grower's Association endorsed the Forest Service's proposal to designate Mt. Baldy and Sycamore Canyon as wilderness areas while opposing the Pine Mountain proposal. Cattlemen understood that they were in a new political environment in which they were greatly disadvantaged in numbers and influence. They therefore avoided extreme positions whenever they might prove disadvantageous.[109]

Political necessity forced cattlemen to compromise on the subject of wilderness areas, but as a group cattlemen advocated less intervention in their business by the federal government and strict adherence to the rule of multiple use of public land. They critically noted an apparent shift in resources by federal agencies like the Forest Service and Bureau of Land Management towards recreational use of the land. They also understood the importance of the Public Land Law Review Commission Act passed at about the same time as the Wilderness Act, to study effects of federal land law and policy and to recommend changes. This study, completed in June 1969, included a number of policy alternatives. The alternative most favored by western stockmen was the disposal of grazing land by the federal government to state and private control.

[109] William F. Schroeder, "Cobwebs on the Public Lands," *AC*, September 1960, 6-15; William C. Davis, "Statement of Arizona Cattle Growers' Association on Proposal to Reclassify Pine Mount Primitive Area to Wilderness," *AC*, November 1966, 48, 50-54; Bill Davis, "Statement of Arizona Cattle Growers' Association on Proposal to Reclassify Sycamore Canyon Primitive Area to Wilderness," *AC*, April 1967, 4-6.

The cattlemen's advocacy of ending federal management of grazing in the western states grew as they perceived the government leaning ever more against their interests. This tension would finally flare into the so-called Sagebrush Rebellion, which followed passage of the Federal Land Policy and Management Act of 1976. The movement seemed to gain momentum in the early1980s, when the Reagan Administration's Secretary of the Interior James Watt, a Sagebrush Rebellion leader, forcefully pushed for transferal of federal lands to the states, but was effectively checked. Unable to obtain actual ownership under their own or friendly state hands, stockmen moved into the Wise Use Movement, which upheld the ideals of multiple use.[110]

At the state level, Arizona cattlemen for several years successfully opposed proposals for a state parks system. They feared that extensive state parks would lock up additional grazing land. Arizona was the last of the lower 48 states to establish a state parks system, which came about only after a compromise was worked out between cattlemen and parks advocates. The legislation passed in 1957 establishing the Arizona State Parks Board mandated that two of its members represent the livestock industry. Also, the bill limited the size of parks the Board could establish without a legislative mandate.

At the same time as the Arizona cattle industry was entering a new era, some of its last survivors of pioneer days were leaving the scene. Edward L. Jameson, one of the most prominent rancher/politicians in Arizona died at the age of 75 in 1960. A number of prominent cattlemen passed away in 1962, such as J.M. Cartwright; Phillip Tovrea, Sr.; Charles Pickrell, the long-time director of the UA Cooperative Extension Service; W.T. Waggoner, Jr., a millionaire sportsman and cattleman of Phoenix; and Charles E. Collins, one of the leading authorities on old cowboy lore and friend of writers like Ross Santee and Zane Grey. John Evans, one of the earliest Arizona advocates for Aberdeen-Angus cattle and leading figure in the Arizona Angus Association also died in 1962 at the age of 62. The one-time Speaker of the Arizona House of Representatives was one of the most respected ranchers in Mohave County. Later deaths marking the end of the early modern era included Granville "Dan" Fain (1879-1962), Ransom C. "Rans" Spurlock (1893-1967), and F.N. Bard (1882-1970).[111]

One of the most significant losses was that of Alan Feeney in 1959. At the time of his death he was a leading spokesman for the Hereford breed and was serving as president of the American Hereford Association. The transplanting of his Milky Way Ranch had in no way harmed his proclivity for winning

[110] Peter E. Marble, "Rancher-Government Relations," *AC*, September 1969, 6, 8, 35; "The Public Land Law Review Commission Act," *AC*, September 1965, 14; John H. Tudor, "The Forage Resources Study – The Alternatives," *AC*, October 1969, 15, 18.
[111] "J.M. Cartwright," *TSM*, May 1962, 35; "Phillip A. Tovrea Dies," *TSM*, April 1962, 45; "Charles U. Pickrell," *TSM*, February 1962, 35; "W.T. Waggoner Jr.," *TSM*, May 1962, 36; "Charles E. Collins," *TSM*, June 1962, 29; "John Evans Dies," *TSM*, November 1962, 40; "Edward L. Jameson," *TSM*, March 1960, 43.

grand prizes in national cattle shows; he doubtless would have continued strong for many years had he not been struck suddenly by polio in July, dying after. Having no heir interested in following his passion for Herefords, his top-ranked herd was dispersed to breeders outside of Arizona within a matter of months. The Milky Way Ranch, the best known of all ranches of the post-war era, disappeared after dominating the scene for fifteen years.[112]

After 1965, the price of cattle began to increase. While ranchers welcomed this price increase, it was eventually recognized as part of an inflationary spiral that would plague the American economy for many years to come. Ranchers were aghast at suggestions that their industry required greater regulation in order to control prices. They responded defensively to suggestions that the protective Meat Import Act of 1964 contributed to inflation and criticized the 1970 report "Federal Responsibility for Retail Price Increases for Beef" that suggested that the industry be treated as akin to a public utility. Already revised once in the 1960s, a White House conference panel in the fall of 1969 recommended another revision of the USDA food quality grades to upgrade leaner beef, to promote nutritional value, and to remove reference to traditional factors such as conformation.[113]

At the same time, the National Livestock Tax Committee kept close watch on legislation affecting taxes. The issue of tax shelters had become something of a national scandal, although perhaps exaggerated by the media. Congress considered several proposals to reduce the supposed large number of tax shelters. For example, one proposal would have limited favorable capital gains provisions to persons or firms whose primary income came from agricultural sources. Other suggestions included eliminating the deductibility of losses from so-called hobby ranches. The National Livestock Tax Committee argued that many of these proposals would hurt legitimate ranchers. Still, the Tax Reform Act of 1969 signed by President Nixon included several provisions to recapture deductions taken for loss on sale of farm products and to eliminate the tax advantages of hobby ranches. The Act's sponsors believed it would relieve some of the pressure on excessive land values. Also, they hoped it would reduce the supply of cattle from hobby ranches.[114]

Or would it? A study by two UA agricultural economists in 1970 challenged some of the assumptions that were commonly held by ranchers and policy makers. The price of ranch land in Arizona, they knew, was extraordinarily high. Most people attributed this to such factors as the pressure of urban development and the impact of investments in tax shelters. The business of ranching itself had relatively low returns on investment. The economic study, however, found that developmental pressure could only account for high

[112] "Hereford Show to Honor Alan Feeney," *TSM*, December 1960, 9; "Milky Way Cows Go To Oregon," *TSM*, November 1959, 41.
[113] J.C. Hobert, "Beef Imports and Beef Grading," *AC*, September 1970, 4, 6.
[114] Robert P. Kelly, "Tax Reform Act of 1969," *AC*, September 1969, 24-26; *AC*, January 1970, 4-8, 10.

ranch prices near the urban boundaries and that evidence from the cost of leased land indicated no apparent effect elsewhere. Also, the reality of tax shelters was that they were far less common than generally presumed. The economists' conclusion was that prices were being held artificially high because ranchers were making a lifestyle choice to hold and acquire ranch land. Ranchers genuinely loved their rural lives, believing they promoted family values and promoted a production ethic that challenged the increasingly consumer-oriented popular culture. Looking to the future, however, the economists noted that the median age of ranchers in their study was 59 and that most admitted that their sons were unlikely to carry on their ranching business. This would mean that starting around 1980, there would begin a wave of property transfers as old-timers or their heirs sold their land. It was in this regards that ranchers could take comfort in people like Roy and Jackie Holland. Roy for several years had managed the Rancho Sacatal in partnership with his father, but when the time came to dissolve the partnership in 1967 and disperse much of its herd, Roy and Jackie retained a part of the herd sufficient to continue in the business on their own.[115]

Contemporary Cattle Ranching in Arizona, 1970-Present

To close this context of the cattle ranching industry in Arizona during the first twenty-five years following the Second World War, a few points should be said about major issues facing the industry since 1970. Earlier sections of this document have already mentioned important issues such as the continuing concentration of ranching into a small number of larger business operations, the continued reliance of agriculture in general on federal support, and the intense competition between beef and poultry for the consumer's food dollar. Should this document be again amended to consider the historic context of cattle ranching after 1970, additional topics are likely to include environmental issues such as pollution deriving from concentrated animal feeding operations (CAFOs), the debate over treating animals with hormones, antibiotics, and preservatives, and the implications of the modern revolution in genetic engineering.

The waste products associated with CAFOs and meat processing facilities have become one of the major environmental issues of our day. The U.S. Environmental Protection Agency, under the authority of the Clean Water Act, attempts to regulate point sources of surface water pollution through the National Pollutant Discharge Elimination System (NPDES). The NPDES is administered by state agencies such as the Arizona Department of Environmental Quality (ADEQ), which has additional state authority to regulate discharge of storm water. The ADEQ licenses any animal feeding operation that it deems a significant

[115] Arthur H. Smith and William E. Martin, "Cattle Ranching – A Business or a Way of Life," *AC*, September 1970, 22-24, 26-29; *AC*, September 1967, 7.

source of pollution or confines certain minimum number of cattle, swine, horses, sheep, or poultry. Department inspectors examine CAFOs for actual or potential run-off or discharge of contaminated water from the facility. State law allows for an escalating system of fines of up to $25,000 per day for each violation.

Arizona's NPDES program has come under legal challenge. The limited effectiveness of government regulation has led private organizations like the Sierra Club and the Center for Rural Affairs to monitor the CAFOs and giant meat processing factories that have a profound influence on the conditions of rural life, pollution, and the safety of meat in the American diet. These organizations educate the public and policy makers and, at times, take stands in the courts by backing or initiating legal challenges against suspected polluters. At the same time, the food industry seeks innovative means to protect their products from costly recalls or potentially adverse publicity through modernization. The recent spectacular growth in the Organic Foods market has not challenged the position of the largest corporate entities. Indeed, most firms such as ConAgra and Tyson, as well as major grocery retailers like Safeway, have jumped into the Organics market, taking advantage of the willingness of at least a segment of the public to pay premium prices for food it perceives as more healthful and environmentally friendly.[116]

During the period of study covered in this document, cattle producers were experimenting with an ever-widening range of antibiotics to control animal diseases. The need for antibiotics became increasingly important as animals were confined into tighter spaces amidst vast numbers other cattle. Also, as the possibilities of improving the marketability of cattle through selective breeding shrank, stockmen turned increasingly to science for hormone products to artificially supplement their animals' growth. Although profitable, growth hormones quickly became controversial, their implications for the human consumer being unknown. The Organic Foods market is in large part a product of consumer confusion over the unknown hazards that might be associated with meat resulting from cattle growth hormones. Already there are ranchers taking advantage of such concerns by marketing grass and grain-fed cattle without exposure to pesticides or growth hormones.

An example of a new kind of niche for cattle raisers is the Anchor Ranch, located north of Clifton. The Anchor Ranch is owned by Will and Jan Holder and has been in the Holder family since the 1930s. It is small, with only thirty deeded acres and some 10,000 acres leased in the Apache-Sitgreaves National Forest. Facing drought and low cattle prices in the early 1990s, the Holders realized that they could not continue to ranch profitably in the common cattle market. Getting together with other conservation-minded ranchers,

[116]U.S. Environmental Protection Agency, Region 9: Animal Waste, http://www.epa.gov/region09/animalwaste/arizona.html; Arizona Department of Environmental Quality, http://www.azdeq.gov/environ/water/permits/cafo.html.

they organized Ervin's Natural Beef in 1997 to market their grass-fed product. By avoiding too-rapid expansion and debt, the firm has survived and expanded so that by 2000 it was marketing about 150,000 pounds of beef annually in Arizona. Although their ranch is located in the National Forest's wolf reintroduction area, rather than oppose the wolf program as many ranchers have, the Holders have used it in their marketing to demonstrate their environmental friendliness.[117]

While some producers find opportunity in the natural beef market, others continue to explore the possibilities of genetically engineered cattle. Since 1970s there has been a tremendous expansion in the ability of scientists to understand and manipulate the genetics of plants and animals. Using recombinant DNA technology, new biotech businesses have developed marketable traits—many patented—in agricultural products to improve resistance to disease, pests, and to increase yield. So far the greatest gains in cattle genetic engineering have been on the dairy side, but there have been efforts to produce a better beef animal as well.

Retailers, such as the grocery chain Safeway, have tried to accommodate these opposing trends by offering a variety of meat products. Already marketing Organic products to satisfy those wanting a more natural food product, Safeway has also partnered with the biotech firm Future Beef, located in Denver, which is seeking to put to use new genetics developments by the USDA's Meat Animal Research Center in Nebraska.[118] It is impossible to know how these competing trends will play out in the next few years, but it will almost certainly have an important effect on the men and women who will run the future cattle ranches in Arizona.

One final trend worth noting is the initiative of a number of environmental organizations to take direct action to preserve natural landscapes threatened by urban development. Cattle ranches have valuable assets in the form of water rights and extensive land holdings, many in areas of great scenic value where development pressures continue to grow. Organizations like The Nature Conservancy and the Grand Canyon Trust have helped to preserve thousands of acres of land by purchasing land outright or through the expedient of buying development rights in the form of conservation easements. In 2005, the Grand Canyon Trust, in partnership with The Conservation Fund, purchased the Kane and 2-Mile Ranches, located north of the Grand Canyon in the region known as the Arizona Strip. The ranches encompass only about 1,000 acres, but include grazing rights to an additional 850,000 acres of public land. To maintain their rights to the

[117] Ben Alexander, *The New Frontiers of Ranching: Business Diversification & Land Stewardship*, (Tucson: Sonoran Institute, 2000): 16-18; http://www.heartofthewolf.org/Links.htm.
[118] Tom Abate, "Better Beef Through Biotech," *San Francisco Chronicle*, 11 February 2001, http://www.mindfully.org/GE/Better-Beef-Safeway.htm.

grazing permits, the newly organized North Rim Ranch LLC will have to manage cattle; they cannot simply allow the land to lay unused for wildlife.

The Kane Ranch headquarters (NRHP listed, 2 January 2008) is an excellent example of nineteenth-century pioneer architecture and possesses historic associations to William "Buffalo Bill" Cody, Zane Grey, and other figures of late frontier and early modern eras who traveled through the Arizona Strip. The Nature Conservancy has also found historic ranches to be optimal places for land and wildlife conservation, managing preserves at the former Muleshoe Ranch and Pride Ranch near the Galiuro Mountains, the Cobra Ranch in Aravaipa Canyon, and the Brill Ranch in Wickenburg (Arizona Register of Historic Places listed, 6 November 1975). The Nature Conservancy has been able to reuse the historic Frederick Brill House as the headquarters of its Hasayampa River Preserve.

Where purchasing land is not feasible, easements have proven a valuable conservation tool, effectively separating the development potential of land from its current use for grazing. Ranchers can gain immediate tax benefits by donating development rights easements to conservation organizations. In many cases, ranchers have been happy to partner with environmental organizations because such partnerships allow them to pursue the ranching lifestyle while removing the temptation to sell off their land to developers. Conservation easements also avoid controversy associated with the idea of "locking up" the land against commercial uses. Government agencies have assisted in this effort by offering grants to assist non-profit entities to purchase conservation easements. Again, this helps the agencies meet their goals of improving watersheds, protecting wildlife, and promoting recreation without having to directly purchase land.[119]

[119] The Grand Canyon Trust, http://www.grandcanyontrust.org/programs/kane/overview.php; The Nature Conservancy, http://www.nature.org/wherewework/northamerica/states/arizona/preserves/.

==========

The purpose of this section is to provide guidelines for evaluating the National Register eligibility of properties associated with cattle ranching in Arizona. It is a supplement to the earlier *Cattle Ranching in Arizona, 1540-1950* Multiple Property Documentation Form. Historic themes and property types identified in that document remain valid and may be combined with additional themes and property types identified in this amendment. Properties whose periods of significance cross the temporal boundaries of these two documents may refer to both as justification for their statements of significance.

PROPERTY TYPES

This section describes property types associated with cattle ranching that may be considered potentially worthy of preservation. It repeats the major categories found in the *Cattle Ranching in Arizona, 1540-1950* MPDF, expanding the discussion of significance to include associations with themes identified in the present document. The criteria of the National Register of Historic Places are applied to these property types in order to provide guidelines for evaluating their eligibility. The following list includes many properties commonly associated with cattle ranching:

1. Ranch Houses
2. Watering Facilities and Windmills
3. Fences and Cattle Guards
4. Stockyards, Feedlots, and Auction Pens
5. Auxiliary Ranch Buildings and Structures
6. Line Camps
7. Agricultural Fields, Orchards, and Other Agricultural Features
8. Miscellaneous Features
9. Ranch Districts
10. Ranch Landscapes

While the criteria for evaluation will provide guidance in determining which properties may be considered eligible for the National Register individually, it is expected that the eligibility of most properties will depend on their context within ranch districts. Districts contain a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. Some ranching properties not individually significant may be considered eligible if they are part of a larger concentration of buildings, structures, objects, or sites that convey significant aspects of ranching history.

==========

Because of the size of many historic ranches, ranch districts create unique challenges in applying the National Register criteria. A historic ranch may have encompassed many thousands of acres and many of its individual buildings and structures may have been isolated. Today, perhaps only a remnant of the original ranch remains. Alternatively, a historic ranch may have been incorporated into a larger, modern operation. How such properties might convey a larger story of ranching will be discussed below.

Cattle ranching's use of the land is another unique aspect of its history. In most ranches, only a fairly small proportion of the land is intensely developed with buildings, structures, fields, and other property types. Most ranch acreage is simply left relatively undeveloped and the cattle allowed to graze. Isolated properties such as stock tanks, fences, and cattle guards often provide the only evidence that the land is or once was a ranch. However, it would be a mistake to classify rangelands as completely natural. Cattle have grazed throughout Arizona for well more than a century and it has been demonstrated that many changes in flora and fauna have resulted. Because ranching has altered the land in fundamental ways, it is important to consider whether some historic ranches may be classified as rural historic landscapes.

1. Ranch Houses

Description: The ranch house is the building that served as the primary residence of the owner or manager.[120] In addition to serving as a residence, the ranch house often served as the ranch's business office. This dual function makes the ranch house the focal point of the operation. Because it was often a family residence, the ranch house is frequently the most substantial building on the property in terms of size, workmanship, and style. A great variety of styles characterize ranch houses. Some are vernacular in their use of local materials, simple workmanship, and cultural character; others are ostentatious displays of wealth. Many began as small buildings and were enlarged over time to accommodate larger families.

This property type most often fits the National Register functional category of "domestic," with the subcategory of "single dwelling." The National Register significance category would usually be "agriculture," although there will certainly arise opportunities to apply "architecture." "Social history" is another category that may apply.

[120] Note that the term ranch house is used here to refer to any primary residence located on a ranch. This has no relation to the Ranch House Style, which became popular in the middle third of the 20th century, generally in a suburban context.

==========

Significance: These properties are associated primarily with the context of cattle ranching and must relate in a significant way to this theme. Most of these properties would be considered eligible under Criterion A for their association with the broad pattern of cattle ranching history in Arizona.

Ranch house of the modern era. Triangle W Ranch, ca. 1960. Arizona State Library, Archives and Public Records, Archives Division, Phoenix #95-9804.

Some properties might be considered eligible under Criterion B for association with a person important in the history of cattle ranching. The house at the Bard Kirkland Ranch, for example, would be a property associated with F.N. Bard, an important person in the history of cattle breeding in Arizona. Application of Criterion B requires an additional consideration, that the property be compared to others also associated with that person, and a determination that it possesses the strongest direct link among all such potential

properties. Greater detail in the application of Criterion B can be found in the National Register Bulletin *Guidelines for Evaluating and Documenting Properties Associated with Significant Persons*.

A ranch house could also be considered eligible under Criterion C as a typical, representative, or outstanding example of domestic architecture or design. For example, the house at the 26 Bar Ranch, owned by actor John Wayne, is one of the most beautifully designed ranch homes in the state and is today operated by the Hopi Tribe as a bed and breakfast.

A ranch house may also be considered eligible under Criterion D if it has yielded, or has the potential to yield, important information about the history of cattle ranching. The criterion for information potential is greatest for pre-modern properties, those of the Spanish/Mexican period or early American eras, where documentary information is less likely to be available. Ranch houses of the modern era are more likely to remain standing and so are less likely to have become eligible under Criterion D, although this is possible if there is a significant information potential from some characteristics of the property.

Registration Requirements: The first requirement for eligibility is that a property have significance under one or more of the criteria. Given that a particular property may have significance, it must also have integrity as well. Integrity is the ability of a property to convey its significance. Under Criteria A, B, and C, this usually means the ability to *visually* convey its significance. The National Register defines seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. A property with enough integrity in one or more of these aspects to convey its significance may be eligible. Determining which of these aspects are most important to a particular property requires knowing why, where, and when the property is significant.

Eligibility under one or more of the other criteria of significance will require an evaluation of all seven aspects of integrity. For a property significant under Criterion C, integrity of design will be very important. Integrity of design will perhaps be of less importance for a house associated simply with the broad pattern of the history of cattle ranching. Location will usually be important in any evaluation of eligibility. Although the National Register has guidelines under Criterion Consideration B for how relocated properties may be eligible for listing, in most cases a ranch house that has been moved will be ineligible for individual listing. In some communities, historic buildings threatened with demolition have been moved to a single location. While this action saves the buildings, they are removed from their historic setting and so the connection between the history of the property and the place where that history took place has been broken. Integrity of setting may or may not be of great relevance depending on how the property's significance is defined.

==========

Setting will be less important for a property that is nominated under Criterion C for its architectural merit than for a property associated with the broad patterns of agricultural/ranching history.

It is extremely rare for a historic ranch house to have survived to the present time with no alterations or deterioration. Perfect integrity, therefore, is very unlikely. Alterations such as replacement of historic materials in windows or the roof are not unusual. It is also common to find ranch houses that have had substantial additions made to them over the years. The evaluation of such properties' integrity will depend, again, on the definition of their significance. A log cabin that was a ranch house may be significant under Criterion C as an example of vernacular architecture, but it will not be eligible if it has been sheathed with an inappropriate material that hides its character-defining materials and design. On the other hand, there may be examples of historically significant ranch houses that were built as the result of a number of additions to an earlier, smaller building. If these additions fall within the defined period of significance, then the property may be eligible. The extension of the period of significance allowable under the contexts within this document may mean that alterations that occurred through 1970 may have gained significance in their own right.

2. Watering Facilities and Windmills

These properties are described as structures and places where water is taken from the ground for use by cattle or by people. Natural springs are places where water comes to the surface without artificial power. Springs may have improvements such as protective covers and troughs to make them more serviceable to cattle. A well is a dug or drilled hole that provides access to ground water, which is usually drawn up with a pump. Pumps may be operated manually or with a source of power such as electricity or gasoline. Windmills are a common source of pumping power, convenient where electricity is not available or where transporting gasoline is difficult. This property type meets the National Register functional category of "Agriculture/Subsistence" with the subcategories of "energy facility" and "water works." The primary National Register significance categories would be "Agriculture," but may also include "Engineering."

Subtype: Springs

A spring is a naturally occurring place where water comes to the surface without the aid of pumps. In much of Arizona, where the land is arid, a natural spring is a tremendously valuable resource. In pioneer times, the location of springs often determined the location of ranches and limited the extent of grazing. Pipe Spring National Monument is an example of a pioneer fort built literally over a spring to guard its valuable issue. It

==========

was not unusual for a rancher to make improvements around a spring in order to minimize water loss or to transfer water to stock tanks. In the Seven Springs area north of Phoenix, concrete channels were constructed to carry off a portion of the issuing water for use by cattle.

Subtype: Wells

A well is a place where water is drawn up from the ground for use. It differs from a spring in that it is not a natural occurrence and usually is made be either digging or drilling a hole into the ground. The simplest well is little more than a deep hole into which groundwater seeps. The image of a well as a hole where water is drawn up with a bucket secured to a small pulley is well known, but such wells are rare in Arizona. The earliest well, often dug with hand tools, were wide enough for a man to work in. Rock lining of the well's walls gave it stability. Modern wells are drilled deep into the ground and a pipe connects the groundwater to the surface. Furthermore, most wells have to have some sort of pump to draw up the water. The twentieth century introduced electric and gas powered pumps, many wells depend on the power of the wind to draw up water.

Subtype: Windmills

As described in the *Cattle Ranching in Arizona, 1540-1950* MPDF, windmills are a common means for powering pumps, particularly in isolated areas where other sources of power are difficult to obtain. A windmill is a structure with large fan blades that are turned by the wind. This rotational energy is transmitted through gears and shafts to the pump, which draws up the water. The structure holding the fan and pump gear may be constructed of wood or metal frame.

Subtype: Well house

A well house is a structure built over a well to protect it and the pump from the elements. A well house may also function as a storage shed. A gasoline-powered pump within a well house may be connected to a large, external fuel tank.

Subtype: Water tank

A water tank is a structure built to hold the water that is drawn from the well to make it available for cattle to drink. Water tanks may be constructed of concrete, metal, wood, or other materials. This property subtype

differs from the property type Stock Tank, described below, in that it is functionally tied to the well and is usually located in close proximity. A Stock Tank may be a much larger structure that gets its water from sources other than a well.

Subtype: Dams and Reservoirs

A small dam stores water along a stream, which may flow only intermittently. Dams in connection with canals or pipelines could also distribute water to fields and orchards. Dams might serve dual purposes of erosion control and water storage. As described in Section E, ranchers and soil conservation officials sometimes placed small dams along creeks to prevent floods from causing deep gullying. Soil and rock debris building naturally up behind the dam protected water from evaporation and made them effective water reservoirs.

Subtype: Canals and laterals

A canal is an open, built waterway for carrying water from a source like a reservoir, a well, or a spring. A lateral is a smaller canal diverging from a larger canal structure, which carries water to specific fields. Many ranchers developed extensive irrigated fields and orchards to support and diversify their cattle operation. Additional information regarding historic irrigation works may be found in the SHPO context study *Lifeline in the Desert; Water Utilization and Technology in Arizona's Historic Era, 1540-1960* (2006).

Subtype: Pipelines

Pipelines are another system for moving water from a source like a well or reservoir to a tank or to fields. A pipeline can be an important part of a ranch irrigation and watering system.

Significance:

These properties must be associated in a significant way with the context of cattle ranching. Since water is a critical resource for ranching throughout the state, they do have importance. However, only rarely would a particular well, windmill, dam, canal, or other water-related property be of such importance that it can be considered individually eligible for the National Register. More likely, a watering facility may be eligible if it is part of an eligible ranch district or ranch landscape. The headquarters of the Lazy B Ranch, for example, had two large wooden windmills in the immediate vicinity of the ranch house, which were not

==========

only important functionally, but served as character-defining features of the Day family's home environment. An exceptional case of individual significance is a property such as the Iron Turbine Windmill in Prescott, which is listed in the National Register under Criterion C as a unique example of a particular kind of windmill technology.

Registration Requirements:

For a windmill to be individually eligible under Criterion C, integrity of design is critical. The Iron Turbine Windmill was listed in the National Register despite its move from its historic location to the Sharlot Hall Museum in Prescott. This property has also lost some of its integrity of materials since it is now on top of a metal structure rather than the wood structure upon which it was originally located. The key to this property's eligibility, despite the loss of these aspects of integrity, is that its mechanical structure displays a unique solution to the problem of regulating the speed of its rotation in winds that can come from any direction. There may also be unique engineering significance to certain erosion control and water storage dams, although the engineering of dams is not a context covered within this document.
Most watering facilities will only be eligible for the National Register as part of an eligible ranch district or ranch landscape. In such cases integrity of association, location, and materials, as well as design, will be of greater importance. Workmanship is less likely to be an important aspect of integrity as most water facilities will either be factory produced as in the case of windmills, or will be simple, relatively non-descript utilitarian buildings such as well houses. Well houses are unlikely to be individually eligible. A well house that is eligible as part of a ranch district or ranch landscape will retain integrity of association, location, and materials. Water tanks are also unlikely to be individually eligible. A water tank that is eligible as part of a ranch district or ranch landscape will retain integrity of association, location, materials, and perhaps design in some cases.

A natural spring is most likely to be classified as a site, a place where ground water naturally comes to the surface and is then used by ranchers. A small number of springs in Arizona are listed in the National Register. These are variously associated with historic exploration, the military, and early land uses such as cattle ranching. The Pipe Spring National Monument, with its imposing, fortress-like building constructed directly over the spring is associated with pioneer Mormon settlement and cattle ranching in the Arizona Strip region. For a natural spring to be listed individually, it must retain integrity of association, location, setting, and feeling. It is not necessary that water continues to issue from the spring since it is the historic place where water came, rather than its continued modern issuance that is significant. Natural geological processes that shift the path of water flow underground can affect springs. They can also be adversely

affected by human action such as overuse of groundwater that reduces the water table. A few springs may achieve individual significance, but most will be eligible for listing only as contributing elements to a ranch district or ranch landscape.

3. Fences and Cattle Guards

Description:

A fence is a structure built to demarcate a boundary and to limit movement from one area to another. The most common fence associated with cattle ranching is the barbed wire fence, constructed of barbed wire strung between metal or wooden poles. A ranch may contain many miles of such fencing that define grazing areas, boundaries to other land jurisdictions, or that limit cattle access to other ranch properties such as fields or homes. Closer to the ranch house, there may be fences of wood, stone, or other materials. Such fences are usually more costly, limited to the domestic area, and often serve a decorative purpose as well. As stated in the context *Cattle Ranching in Arizona, 1540-1950*, a cattle guard is a structure designed to prevent passage by cattle. They are integral parts of fences and typically located where a road passes through the fence. Cattle guards are effective in preventing cattle from leaving the fenced area so gates are unnecessary except to prevent passage of people. While barbed wire originated in the nineteenth century, its use continued throughout the twentieth century. Materials for posts were typically what was locally available, such as mesquite, saguaro ribs, and/or pine, depending on the local climate. Ocotillo, which has long, fairly straight, thin shafts, with numerous thorns, was often used as a natural substitute for barbed wire, especially in pens. Metal posts gradually replaced natural materials as their cost and the cost of transportation declined. Modern ranches also began substituting electrified fences for barbed wire.

Significance:

The presence of fencing on ranches is one of the primary distinguishing property types between the pioneer era and modern cattle ranching. In the Spanish, Mexican, and pioneer American eras, cattle were left to graze on the open range. Particularly before the invention of barbed wire, fences were expensive to build and were limited to the areas around the ranch house where cattle were not wanted, such as the yard or garden. The modernization of the cattle industry involved the increasing delineation of property boundaries between ranchers and other land managers. The Taylor Grazing Act created grazing districts and the Forest Service and Bureau of Land Management regulated a system of controlled land access. Extensive fencing, along with the system of grazing permits, allowed land managers to control how many cattle were grazing in

a particular area. The invention of cattle guards allowed fencing to occur without hindering transportation with a cumbersome number of gates.

Registration Requirements:

Despite their importance, fences and cattle guards present several difficulties in evaluating their eligibility. Because they are boundary markers, location is a crucial aspect of integrity. This implies that the boundary itself must be historic. Fences may mark many changes in land use. Construction of roads, highways, and expansion of towns and cities has required the construction of hundreds of miles of fences. Only those fences and boundaries associated with the historic period of significance may be eligible. In many cases, cattle guards are modern structures placed where modern roads were run through historic fences. The opposite situation may also occur where modern fences and cattle guards are placed along historic roads.

After location, integrity of materials is most important. Unfortunately, because they are exposed to the elements, barbed wire and wooden poles usually have to be replaced to remain functional. Historic materials may remain on the ground, but are no longer a part of a standing structure. Whether such 'ruins' of fences are eligible under Criterion D depends on whether they may yield important information. This might be the case where such materials are all that indicates the location of an important boundary.

It is unlikely that a fence and/or cattle guard will be considered individually eligible for listing in the National Register. A historic fence and/or cattle guard that retains integrity of location and materials may be eligible if it is part of an eligible ranch district or ranch landscape.

The eligibility of a cattle guard as a contributing element to a ranch district or ranch landscape depends on who built the guard. Railroad guards and guards put on public right-of-ways by highway departments would not be eligible under a ranching context because their priority purpose is not to serve the ranch but to move vehicular traffic through cattle country. A historic railroad cattle guard, for instance, may be eligible under a historic context of railroad transportation as an example of a distinctive piece of roadwork. For a cattle guard to be eligible it ought to have been built or installed by the rancher. A rancher might have built the guard or might have bought it and had it put in place. From a historical standpoint, the more interesting would be one built on the ranch since it would reflect the personal resources and ingenuity of the rancher or the ranch's employees.

==========

In the documentation of ranching landscapes and ranch districts, fencing can be described as a "landscape feature," requiring minimal documentation. It is not counted as a distinct structure. Location of fencing on a map and a brief discussion of the material and type of fencing should be sufficient unless it has some unique or significant characteristic.

4. Stockyards, Feedlots, and Auction Pens

Description:

Subtype: Stockyard

A stockyard is a property type separate from a ranch. Stockyards are typically associated with places where cattle are gathered such as at railroads for transportation or near cities for meat processing. Stockyards contain buildings where people work, auxiliary structures such as storage sheds, pens for holding cattle, cattle shoots for the orderly movement of cattle, scales for weighing cattle, and feed structures. A stockyard may also be associated with a transportation facility such as a rail siding, or a meat processing plant.

Subtype: Feedlot

A feedlot is a specialized ranching-related property where cattle are held for an extended period ranging from several weeks to a few months. The purpose of the feedlot is to provide cattle with specialized feed mixes designed to quickly maximize the animal's weight immediately prior to slaughter. Feedlots were sometimes operated by vertically integrated ranch operations, such as the Tovrea family business, which included range cattle operations, feeding, transportation, and meatpacking. At other times the feedlot was a stand-alone business. The feedlot typically included animal pens, shade structures, food and water troughs, a feed mill, and a business office. Some feed operations also had adjacent fields on which they grew a portion of their own feed.

Subtype: Auction Pens

The auction pen and display grounds are places where sellers and buyers of cattle come together to inspect animals and where auction sales are held. They typically include a large building for the auction which includes display area, benches for audience/participants, chutes, scales, and an auctioneer's podium. A

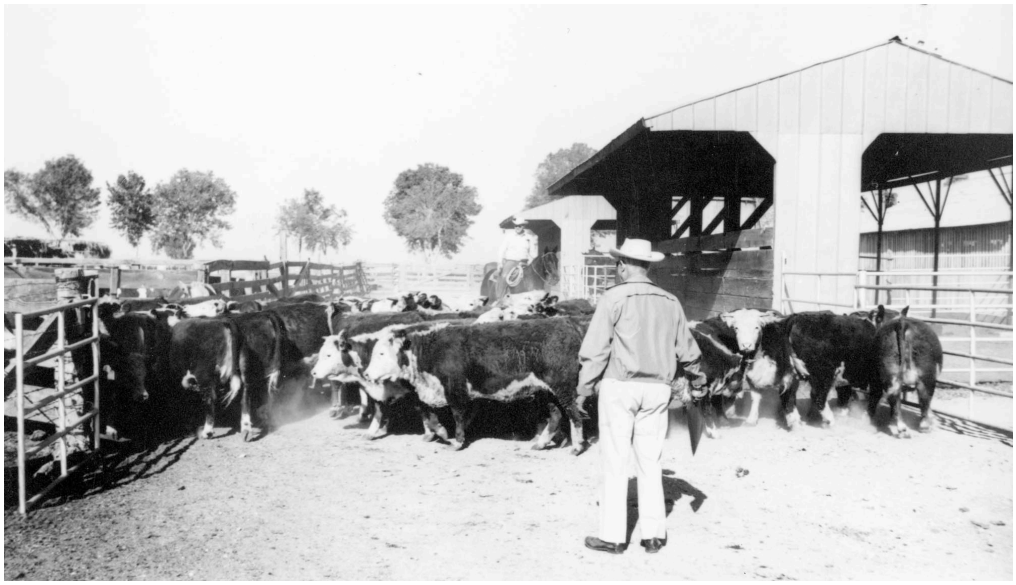
business office might be included within the building or within a separate building. Adjacent to these buildings would be pens for holding animals prior to display.

Significance:

Stockyards, feedlots, and auction venues serve a critical economic function by facilitating the movement of cattle from grazing grounds to processing plants. At times, Arizona has had stockyards that were large even by national standards. Two examples include the Tovrea stockyards located until 1971 along the railroad between Phoenix and Tempe, and a large stockyards located near Casa Grande that was once owned by Hollywood's leading cowboy, John Wayne. Nearby the Tovrea facility was the state's largest auction facility operated by the Cornelius Livestock Company. Such properties would be considered significant under Criterion A for their association with agricultural processing and transportation. Those properties in Phoenix have long since been lost to urban development, but similar properties continue to thrive beyond the metropolitan growth ring. Winslow in northern Arizona and Willcox in southern Arizona are examples of towns where historic stockyards gathered cattle from surrounding ranches for transportation by the railroads. Yuma and the region served by the Yuma and Gila Projects, large irrigation structures built by the Bureau of Reclamation, also developed an extensive cattle feeding infrastructure that replaced much of what was lost from the Salt River Valley.

Registration Requirements:

For stockyards, feedlots, and auction venues, integrity of location, association, design, and materials will be important. Workmanship will probably be of lesser importance. Setting and feeling will also be important, but their retention may be a given; if the properties still exist they will, by their size and continued operation, retain integrity of setting and feeling (to say nothing of smell). A stockyard or feed lot that has ceased operation will very rapidly lose its setting and feeling, as has been the case of such facilities in the Salt River Valley where urban encroachment has forced many cattle ranching operations to disappear. The presence of stock pens is probably the crucial feature that conveys the association with cattle ranching. An office building, where the business work of the stockyards may have been done, may not be eligible by itself without additional buildings or structures that convey the specificity of the business to cattle. The presence of historic transportation facilities, such as a rail siding, may be important. It is not necessary that the stockyard or transportation facility remain in operation. A rail siding that has had its rails removed, but retains the right-of-way, rail bed, and perhaps the wooden ties, should still convey the operation's association with railroad transportation.



Cattle Feedlot, ca. 1960. Arizona State Library, Archives and Public Records, Archives Division, Phoenix #01-4031.

5. Auxiliary Ranch Buildings and Structures:

Description: A working ranch requires a number of auxiliary buildings and structures, such as corrals, bunkhouses, barns, and sheds. These provide working and living space for ranch employees, storage space for equipment, and specialized structures for the management of cattle. Few such buildings and structures are likely to exhibit elements of style, or even necessarily quality. Utility is their primary character and they are typically built of simple materials and with minimal decoration. Some properties may show vernacular characteristics, such as the use of local materials and methods of construction. These properties tend to be concentrated around the main ranch house so that the ranch owner/manager can maintain control over the primary ranch functions. In the modern era, manufactured units increasingly replaced hand-crafted structures on the ranch. The house trailer became the new line camp for the ranch hand.

==========

Subtype: Feed mill

An important property type associated with modern cattle ranching is the feed mill. The mill is a machine (a structure in NRHP terminology) that combines a variety of feed ingredients into a mix. Such machines might be small and hand-built by the ranchers themselves if they possessed the skills. Others were large-scale operations that were commercially built by specialized manufacturers. Such large mills could cost hundreds of thousands of dollars and require several employees to operate. These tended to be built for specialized feed lots whose business was to fatten cattle for final disposal. In more recent decades, site-built feed mills have been increasingly superceded by mobile feed processors that can be transported by truck.

Registration Requirements:

In general, auxiliary buildings and structures are unlikely to be considered individually eligible. Since their purpose is to house or facilitate a specialized function, their significance lies in the combination of all such properties in conveying how a ranch functions. In other words, they may be eligible as contributing properties to a ranching district. They must retain sufficient integrity of association, design, materials, location, workmanship, setting, and feeling to convey the significance of a historic ranch complex.

An important theme identified in this document is modernization through extensive capital investment. Ranchers made great efforts to reduce their labor costs by substituting machinery for workers wherever possible. A ranch associated with the period 1945 to 1970 will possess a number of manufactured structures and machinery and less of the home-built, hand-made items as were previously common. This shift toward manufactured structures reflects the declining self-reliance and increasing market integration of the modern ranch.

The feed mill as a distinctive piece of machinery may have individual significance as a work of engineering reflective of the technology of a particular era. Large firms manufactured the biggest mills, such as the Williamson Mills made in Whittier, California. Sometimes, however, there were many with homemade or custom features that differentiated them. This document does not include a detailed examination of mill technology. Such detail would be required for preparation of an individual National Register nomination under Criterion C. A mill nominated as a contributing property to a ranch district would not require such extensive documentation since its relevance is to the main themes of historic ranching in the modern era. To be eligible, a mill must retain sufficient integrity of design and materials to convey the technology of the historic period in which it was made and operated. A mill modified too heavily after the historic period of its

==========

use would not be eligible. Location is an aspect of integrity of lesser importance, since many of the smaller mills, were intended to be movable.

Subtype: Bunkhouse

A bunkhouse is a multi-residential building for ranch employees. Unlike the line camp, described below, the bunkhouse was typically located near the main ranch residence. It was also intended to house more than one employee, especially seasonal employees, who only required a space for their blankets and relatively few personal items. Early bunkhouses were usually constructed of locally available materials, such as adobe, stone, or logs. As transportation costs declined, milled lumber became more readily available and wood frame board-and-batten construction became common.

Registration Requirements

Bunkhouses are unlikely to be individually eligible. Most will be found along with other ranch buildings and structures and will most advantageously be evaluated as part of ranch historic districts (see discussion of property type "Ranch Districts" below). Bunkhouses will be considered contributors to eligible historic districts if they retain sufficient integrity of materials, workmanship, and design to convey their character from the historic period. It is probable that bunkhouses will have been altered over time, perhaps enlarged or improved with electrical or plumbing service. If occurring in the district's period of significance, such changes will pose little problem. More modern changes, such as replacement of windows or modification of historic exterior sheathing will be more problematic. Addition of utilities should pose relatively little problem to the building's historic character.

Subtype: Single-family residences

Many ranches had year-round employees who typically required larger and better accommodations than bunkhouses. Some of these employees may have had families of their own. As with other ranch buildings, early employee housing was usually constructed of locally available materials, such as adobe, logs, or stone. Lumber largely replaced such materials during the period 1945-1970. Employee single-family housing may display change through time as the building was altered to fit the needs of the employees. Additions and the replacement of materials in windows and siding will likely be acceptable if done during the property's period of significance. The addition of utilities such as electricity and plumbing are unlikely to seriously affect the property's integrity even if done after the period of significance.

==========

It is unlikely that historic employee housing will be other than vernacular in design. The employees themselves may have constructed their housing. Exceptions may be found on Guest, or Dude, Ranches, which may have operated only partially as active cattle ranches. The context of Guest Ranching, however, has not been included in this document, and would have to be developed in a specific National Register nomination. In more recent decades, manufactured housing has largely replaced site-built housing for employees.

Registration Requirements

Employee single-family housing from the period 1945 to 1970 is unlikely to achieve individual significance. Few examples will embody the distinctive characteristics of a style or method of construction. Surviving examples from earlier eras may, however, display the distinctive characteristics of vernacular culture and local materials. In most cases, such housing will occur in conjunction with other ranch buildings and structures, and will most advantageously be evaluated as part of the Ranch District property type. A single-family employee's residence will likely be classified as a contributor if it maintains and conveys its materials and design from its period of significance. Integrity of location will be an important consideration if the property was constructed on-site at the ranch. However, throughout the era covered in this document, trailers and mobile homes found increasing acceptance as an affordable alternative to site-built housing. In this situation, integrity of location may be of lesser consideration. This would be especially the case where a mobile unit was moved about the ranch during its period of significance, and so at least maintained a link to the location of the ranch, if not to a specific piece of ground.

6. Line Camps

Description: Line camps are a distinctive class of auxiliary buildings. Unlike the above listed auxiliary buildings, line camps are not part of the central ranch complex. They were built on the ranch at widespread distances as places where ranch employees could reside while riding the fences, maintaining windmills, and performing other tasks necessary on the range. More than the central ranch complex, the line camp conveys an essential feature of Arizona ranching with its reliance on large spaces in order to overcome the arid climate. In the era when the horse was the primary means of transportation, line camps were necessary because cowboys might need many days to travel the extent of a large ranch. Line camps are typically small and simple buildings with little or no ornamentation. Vernacular characteristics may include use of local materials and workmanship. For example, in northern Arizona, line camps are more likely to be log cabins,

A modern variation of a home on the range. A mobile home on the Cluffs Ranch, ca 1970. Arizona State Library, Archives and Public Records, Archives Division, Phoenix #02-8348.

while in the south they may be adobe dwellings. Line camps typically occur in association with other structures such as a well and windmill. In the modern era, line camp buildings are more likely to be manufactured house trailers or mobile homes. It will be found, however, that although they may be technically mobile, many such buildings have remained in place for many decades. The number of manufactured housing units on ranches is unknown, but they are not expected to occur in large number. In the first place, modern ranches require fewer employees than earlier ranches. Secondly, improved roads and increasing use of automobiles have made such isolated residences largely unnecessary.

Registration Requirements:

Because of their isolation, line camps are unlikely to be eligible as contributors to ranch headquarters districts. Their eligibility will depend on either their ability to individually convey their significance, or to

convey as contributors to the property type Ranching Landscape (see discussion below). An example of an individually listed line camp is the Gachado Well and Line Camp located in Organ Pipe Cactus National Monument. This property consists of an abandoned well, a small, one-room adobe house, and a corral, which admirably convey an important aspect of historic ranching in southern Arizona—the role of the cowboy who often lived and worked in isolated conditions. The vernacular aspects of this line camp can be seen in its use of locally available materials. The house is constructed of adobe, a common building material in southern Arizona. The corral is built of mesquite, palo verde, and other local materials. In order to convey its significance, a line camp must retain integrity of association, location, materials, setting, and feeling. Workmanship and design may be important if the vernacular aspects of the property are significant.

In evaluating the eligibility of a line camp, integrity of location and setting will be relatively important. The property must convey the purpose for which it existed, which was the maintenance of distant ranch structures and roaming cattle in places too distant to conveniently reach from the ranch's headquarters. It may be found that integrity of materials and workmanship have eroded due to lack of maintenance, since many line camps have been abandoned. This will not be of great concern unless the disrepair threatens the building with ruin.

A line camp may be eligible under Criterion D if it can be determined that the site contains information important to history. Even a line camp that has fallen completely into ruins may still retain materials and evidence of occupation that can provide important information about how and when the camp was used. There is likely to be historic refuse scattered at the site or perhaps a concentrated dump site. This document has not specifically addressed the issue of research questions that may be answerable through the archaeological investigation of ranch properties, but researchers may find guidance in the SHPO context: *Down in the Dumps; Context Statement and Guidance on Historical-Period Waste Management and Refuse Deposits* (2005).

7. Agricultural Fields, Orchards, and Other Agricultural Features

Description:

Many cattle ranches also include other agricultural features. It is not atypical for a ranch to have irrigated fields to provide limited pasture for horses, cattle, or other animals. A ranch with more extensive fields could raise a significant yield of crops—usually alfalfa—for feeding cattle, an important supplement for the

natural grasses of the range. Since arid Arizona has historically been important for breeding cattle rather than fattening for final market, these fields rarely could provide the full feed necessary for a profitable herd.

Orchards and other agriculture fields can also represent a diversification of the ranch's production. This is particularly important for smaller family-owned ranches, where self-sufficiency was more valuable than economic specialization. Supporting agricultural features can include small canals and pipelines to convey water for irrigation. Some ranches included hundreds of acres of fields, orchards, and other agricultural features. Most of this acreage tended to be located in close proximity to the ranch headquarters. This occured for two reasons: first, horticulture requires more intense labor and management than the widespread cattle operation. Secondly, many ranches have a limited water supply, around which agricultural and domestic uses tended to concentrate.

Ranches also typically included landscape plantings of shade and decorative trees and gardens. These helped to make the ranch homes more pleasant by being more distinct from surrounding natural areas. These plantings will often be obvious to visitors because they might include non-native species and water-intensive shade species. These landscape features should be considered contributing if they date from this historic period, even if they have not been aesthetically trimmed and cared for.

Registration Requirements:

Fields, orchards, and other agricultural features are likely to be eligible as contributing features of either a ranch district or a ranch landscape. Without an association with other ranch property types, it would be difficult for such properties to convey the context of cattle ranching. These agricultural features must retain integrity of association, location, and setting. Materials, design, and workmanship will likely be of lesser importance. It is not necessary that a field remain in use. A former field can still convey its historic agricultural use as long as it remains relatively free of native vegetation and retains its original contour. The survival of related structures, such as a canal that transferred water to a field, is important to convey how agriculture was accomplished in an arid environment. It is not necessary that a structure such as a canal fully retain integrity of materials as long as it conveys its primary characteristics. An open ditch in its historic location can convey integrity of design, even if it has been modernized with concrete lining.

8. Miscellaneous Features

Subtype: Stock trails

==========

Stock trails are routes used to transport livestock on hoof. The most famous of these are the "long drive" trails immortalized in Western fiction. A few long drive trials in Arizona were used to transport cattle from New Mexico and Texas to California. All generally followed the Gila River trail; very few cattle were moved across northern Arizona.

With the completion of the transcontinental railroads, the era of long trail drives ended. Within the state are a number of "short drive" trails over which cattle moved to different pasturage or to shipping points. LaRue's 1918 survey for the U.S. Geological Service mapped most of the livestock trails existing in the state at that time and distinguished cattle from sheep trails. Remnants of these trails remained in use after the Second World War, but were thereafter rapidly abandoned as the state's highway system expanded. The extensive Indian reservations retained some of the last of these old trails.

Registration Requirements:

A significant stock trail is likely to be eligible either individually, or as a contributing element to a ranch landscape. A stock trail is not necessary linked historically to a single ranch. For example, a trail may have served to transport cattle from many ranches to a railroad shipping point. Trails, therefore, may represent a somewhat different historic context than is addressed by the ranching context. For an extended discussion on how to evaluate the eligibility of historic trails, see the SHPO context study *Historic Trails in Arizona From Coronado to 1940* (1994).

Subtype: Railroad siding

Railroads provided an important means of transporting cattle across Arizona. The two transcontinental routes brought calves from the Texas and southern Plains region, and later carried fattened cattle west to the urban meat markets of the West Coast. Towns such as Winslow and Holbrook served as regional collection points for a large range, covering many ranches along the Atchison, Topeka, and Santa Fe Railway, while Willcox provided a similar service to ranchers along the Southern Pacific. Sidings typically consisted of pens, loading chutes, and, perhaps, water and feed troughs, with wells or sheds for feed storage.

==========

Registration Requirements:

A railroad siding might vary in size and significance depending on its location and the size of the region it served. Large sidings serving a wide region, such as the Colorado Plateau region around Winslow, were an important part of the local economy and represented its main connection to the range economy. Such properties may meet Criterion A eligibility under a context of local commerce associated with the cattle industry. Such properties contributed greatly to the image of the communities as "cow towns." A small, isolated siding is unlikely to be individually eligible because by itself it fails to convey an important aspect of history. On the other hand, such a property may qualify as a contributor to a ranch landscape illustrating the interdependence of a variety of ranching-related properties. Evaluation of railroad sidings should also take into consideration the context of railroading. See the SHPO context study, *Transcontinental Railroading in Arizona, 1878-1940.*

Subtype: Cemeteries and Graves

It was not uncommon for rural people to bury their deceased on their property. Many historic ranches, particularly those from the earliest periods, have known graves. Formal cemeteries on ranch properties are rare. Graves may occur as small family plots near the main ranch house, or as isolated graves on the range. Sandra Day O'Connor related in her memoir how she and her brother secured the cremated remains of their parents in rock cairns on a desolate volcanic hill near the Lazy B ranch headquarters.

Registration Requirements:

While graves are often seen as lasting memorials to important persons, the National Register restricts the eligibility of cemeteries and graves because it prefers to select properties associated with a person's productive life. There are exceptions to this rule. For example, if a ranch was significant because of its association with a historically important rancher and his grave was located on that property, the grave would be an eligible element of the ranch complex. Cemeteries are usually not eligible unless they hold the remains of persons of transcendent importance, have distinctive design, or have special association with historic events. Burial places may be contributing elements of historic districts if they are integral to the district, but not its focal point.

Cemeteries and graves must retain integrity of location and association to be considered eligible either individually or as contributors. Integrity of design is more difficult to pre-evaluate because many historic

cemeteries lose grave markers over time. Also, as time passes, graves become less distinct on the surface and so some may now only be approximately known. Exactitude will be less important where the grave or cemetery is historically associated with the ranch property, but is not its primary focus.

Subtype: Privies and dumps

Archaeologists have found that privies often served as convenient dumpsites for ranch trash. Ranches may have also had special dump areas as well. For additional discussion on the evaluation of historic privies and dumps, see the SHPO context study, *Down in the Dumps; Context Statement and Guidance on Historical-Period Waste Management and Refuse Deposits* (2005).

Registration Requirements:

These properties may be individually eligible under Criterion D for their potential to yield significant information as long as the sites retain integrity of association, materials, and location. Also, there must be evidence that the information available in the dump can answer specific research questions related to historic events or broad patterns of history. It is more likely that the dump site or privy will be a contributor to a Ranch District, eligible under Criterion A.

Subtype: Landing strips

Private airplanes have given even the remotest ranches access to the outside world. Many modern ranches now include landing strips. Early landing strips tended to be of simple construction, a long field cleared of brush and rocks. A wealthy rancher owner might build a smoother landing field with asphalt. These remote, rural landing fields rarely included many structures other than the landing strip itself, a wind sock indicating the direction of the wind, and a small hangar for storage of the airplane.

Registration Requirements:

While the earliest landing strips might be considered individually eligible, it is more likely that they would be eligible only as a contributing structure in a ranch district or landscape. Integrity of both design and materials will be important. A historic landing field will tend to be relatively short by modern standards, and have few improvements. A field that has been extended, widened, or resurfaced outside the ranch's period of significance is unlikely to be considered a contributing structure.

==========

9. Ranch Districts

Description:

The National Register defines a historic district as a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. A historic district for a cattle ranch could contain any of the above property types. This document has attempted to limit the definition of a ranch district to the area immediately surrounding the primary focus of ranch activities. This area would include the main house, auxiliary buildings and structures, some fences and cattle guards, watering facilities and windmills, and other agricultural fields and features. As such, large expanses of range will most likely not be included. These buildings, sites, structures, or objects can, as a district, convey the full sense of ranch activities. While a line camp might technically be a historic district if it includes more than one feature, it conveys only a very limited aspect of ranch operations.

Registration Requirements:

In order to be eligible as a district, the concentration of ranch-related properties must be able to convey their historic significance. The district as a whole must retain integrity of association, location, design, materials, workmanship, setting, and feeling. It is not necessary that every contributing element retain sufficient integrity to individually convey its significance. The Colter Ranch Historic District, for example, lacks its historic main house, but retains sufficient other buildings and structures to convey much of what constituted an important historic ranch. A historic ranch that continues to operate is likely to also include a number of modern features or historic features that have been modified for continued use. The ranch might include a modern home, its well might be pumped with a gasoline motor rather than a windmill, or it might have modern metal sheds. The presence of modern features will not disqualify a ranch district from listing as long as the district as a whole largely conveys its historic characteristics, and it retains sufficient integrity of feeling.

In determining the eligibility of districts, it has been common practice in Arizona to use the fifty-one percent rule. This rule states that a district can be eligible as long as a majority of the properties within it are contributing. A problematic application of this rule has resulted in the gerrymander of district boundaries to exclude non-historic properties, thereby ensuring that a majority are contributors. A better method is to examine the historically defined boundaries of ranching activity and draw the boundary around that. If a

majority of properties are not contributors, then it is unlikely that the district retains integrity of association, setting, and feeling, and so should not be considered eligible.

The National Register allows for discontinuities in districts, which are defined as "two or more definable significant areas separted by nonsignificant areas" (see *How to Apply the National Register Criteria for Evaluation*, 6)

Properties within an historic ranch district are likely to have been built over a long span of years. Care must be taken to properly define the district's period of significance so that its contributing properties reflect this evolution through time. A particular problem may arise with the conversion of an historic cattle ranch into a later tourist facility, or "Dude" ranch. Such a conversion may reflect an important change in context. The evaluation should be made as to whether the general feeling conveyed by the property is one of a working cattle ranch or a tourist facility. The latter context has not been covered within this document.

10. Ranch Landscapes

The broadest category of ranch-related properties is the ranch landscape, which is a special type of district. This category can include all of the above property types, including one or more ranch districts. At the present time, Canoa Ranch, located in Pima County, is the only ranch property that has been listed in the National Register as a rural historic landscape. As interest in the preservation of the state's remaining open areas increases, it is expected that there will be greater interest in the nomination of rural historic landscapes.

One of the distinguishing features of Arizona cattle ranching is its use of vast areas of land as range. In the earliest eras, this range was open and limited only by the rancher's ability to manage his herds and the availability of water. In the twentieth century the open range was fenced. However, fencing only regulated land use; it did not mean that cattle could not roam over ranches of many thousands of acres.

There is some misconception that beyond the confines of the ranch headquarters and associated buildings and fields, the range consists of natural landscape. The above historic context, however, describes how ranching has altered the land in many ways. The ranch landscape includes the full range of property types, including distant line camps, cattle trails, and miles of fences and roads. In the landscape, it is the land itself that is the unifying feature, the range over which cattle historically roamed is the property.

==========

The realization that cattle have altered the land is not a new discovery. Ranchers at the turn of the last century observed how overgrazing changed vegetation patterns and caused erosion. There are vast expanses of Arizona that are taken to be natural landscape that are, in reality, historic cattle ranching landscapes. The National Park Service has conducted evaluations of historic ranches on lands under its jurisdiction and applied the concept of historic landscape across tens of thousands of acres. While so far no such extensive landscape has been formally submitted for nomination to the National Register, the National Park Service treats them as Register eligible for management purposes.

Registration Requirements:

The National Register Bulletin *Guidelines for Evaluating and Documenting Rural Historic Landscapes* defines a rural historic landscape as a "geographic area that historically has been used by people, or shaped or modified by human activity, occupancy, or intervention, and that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features." As a property type, the rural historic landscapes would be classified as either sites or historic districts. While there is no need to repeat the details from the bulletin in this document, it should be noted that it emphasizes properties that one would more readily identify as farming landscapes rather than ranching landscapes. The term 'open range' is mentioned in its discussion of boundary demarcation, but its potential application to areas of tens of thousands of acres is not explored. A ranch located in Nebraska is mentioned as an example of a cluster of buildings and structures that would more likely be interpreted in this document as a ranch district. Whether vast areas grazed by cattle, but lacking obvious human-made objects such as roads, fences, tanks, or other structures meet the definition of "shaped or modified by human activity, occupancy, or intervention" has not been fully tested. The listed Canoa Ranch Rural Historic Landscape includes a cluster of buildings and structures associated with the headquarters area of the ranch and range land totaling nearly 5,000 acres. While this is one of the largest National Register-listed properties in Arizona, even it does not fully test the issue of the eligibility of the gigantic ranches known throughout Arizona's history.

The key would be to identify how the land visually conveys changes wrought by cattle ranching. If the land is scientifically shown to have been significantly altered by decades of cattle grazing, then the range may be a historic landscape. On the other hand, if the land remains fairly natural with little trace of cattle activity, then it lacks the necessary character to convey cattle ranching. A ranching landscape must retain integrity of association, location, setting, and feeling. Integrity of materials, design, and, perhaps, workmanship, will be of lesser importance. Almost certainly a ranching landscape will contain a number of non-contributing

elements. These must be in a small enough proportion so as to not alter the general historic character of the landscape. The boundary of a ranch rural historic landscape may be large, but it might not be to the full extent of the ranch's historic operation. Ranches often subdivided or consolidated over time, and it may be that only a portion of the property retains integrity. Also, jurisdictional boundaries may be relevant as only sympathetic owners may wish to preserve their historic properties. Such was the case, for instance, with Canoa Ranch, which was acquired by Pima County explicitly for preservation purposes. It is large, but is not now as extensive as it once was.

==========

GEOGRAPHICAL DATA

This multiple property documentation form refers to resources and properties located within the boundaries of the State of Arizona.

==========

SUMMARY OF IDENTIFICATION AND EVALUATION METHODS

This multiple property documentation form (MPDF) was prepared using resources and documents located at the Arizona State Library, Archives, and Public Records, the Arizona State Historic Preservation Office (SHPO), Arizona State University, and the Phoenix Public Library. Although SHPO has not conducted a historic building survey specifically targeting cattle ranching properties, its historic property inventory contains information about many historic ranches. A small number of these are listed in the National Register of Historic Places. Much of the narrative is derived from published works about cattle ranching in Arizona, some from government reports, and some from primary materials such as census records and individual property files. This work was undertaken by William S. Collins, historian for the Arizona SHPO in 2007.

This document supplements and amends the previous *Cattle Ranching in Arizona, 1540-1950* MPDF, approved by the Keeper of the National Register in 2002. The motivation for this work was the submission by Pima County of several National Register nominations for ranch properties under its ownership. For some, the period of significance extended beyond the period defined in the existing MPDF. To assist with the nomination of these properties, and in anticipation of additional ranching properties being submitted in the future, this project was undertaken to extend the context statement on historic cattle ranching in Arizona.

The 1970 end date was chosen for two reasons. First, the historic context of the beef industry entered an important new phase during the 1970s making that date a reasonable stopping point for a study of the early period of industry modernization. Second, the date was chosen to be well enough beyond the current date so that the document may serve as a valuable planning tool to assist nominations for a number of years without requiring further amendment. The earlier MPDF was already beyond its period of significance at the time of its approval, which limited its usefulness.

Property types were identified during the research process by recording buildings, structures, and objects typically used by livestock raisers. Many of these had been identified for the 2002 MPDF but the current research identified a number of new property types associated with modernizing technology during the period 1945-1970. These have been included in the description and evaluation part of Section F. The evaluation of property types and their registration requirements follows that identified in the 2002 MPDF. These registration requirements were guided by the National Register bulletins describing the criteria for eligibility, including the special bulletin on rural historic landscapes.

==========

MAJOR BIBLIOGRAPHIC REFERENCES

Books

Alexander, Ben, *The New Frontiers of Ranching: Business Diversification & Land Stewardship*, (Tucson: Sonoran Institute, 2000).

Bahre, Conrad Joseph, *A Legacy of Change: Historic Human Impact on Vegetation of the Arizona Borderlands* (Tucson: University of Arizona Press, 1991).

Bourne, Eulalia, *Woman in Levi's* (Tucson: University of Arizona Press, 1967).

Carlson, Laurie Winn, *Cattle; An Informal Social History*, (Chicago: Ivan R. Dee, 2001).

Chauncey, Tom (as told to Gordon A. Sabine), *Tom Chauncey: A Memoir by Tom Chauncey* (Tempe: Arizona State University Libraries, 1989).

Cronon, William, *Natures Metropolis: Chicago and the Great West* (New York: W.W. Norton, 1991).

Hughes, Stella, *Hashknife Cowboy: Recollections of Mack Hughes* (Tucson: University of Arizona Press, 1984).

Hunt, R. Douglas, *Problems of Plenty: The American Farmer in the Twentieth Century* (Chicago: Ivan R. Dee, 2002).

Jordan-Bychkov, Terry G. *North American Cattle-Ranching Frontiers: Origins, Diffusion, and Differentiation* (Albuquerque: University of New Mexico Press, 1993).

Jacobson, Judith Anne, "The Phoenix Chamber of Commerce: A Case Study of Economic Development in Central Arizona (Master's Thesis, Tempe: Arizona State University, 1992).

O'Connor, Sandra Day, and H. Alan Day, *Lazy B: Growing Up on a Cattle Ranch in the American Southwest* (New York: Random House, 2002).

Rak, Mary Kidder, *A Cowman's Wife* (Austin: Texas State Historical Association, 1993).

Rak, Mary Kidder, *Mountain Cattle* (Boston and New York: Houghton Mifflin Company, 1936).

Sharp, Robert L., *Bob Sharp's Cattle Country; Rawhide Ranching on Both Sides of the Border*, (Tucson: University of Arizona Press, 1985).

==========

Skaggs, Jimmy M., *Prime Cut: Livestock Raising and Meatpacking in the United States, 1607-1983* (College Station: Texas A&M University Press, 1986).

Striffler, Steve, *Chicken: The Dangerous Transformation of America's Favorite Food* (New Haven and London: Yale University Press, 2005).

Walker, Don D., *Clio's Cowboys: Studies in the Historiography of the Cattle Trade* (Lincoln and London: University of Nebraska Press, 1981).

Newspapers and Periodicals

The Arizona Cattlelog (referred to in footnotes as *AC*).

The Arizona Republic.

Arizona Stockman, later *The Stockman Magazine* (referred to in footnotes as *AS or TSM*).

California History, Spring 2007.

The Phoenix Gazette, 14 September 1964.

Government Publications

The Arizona Cattle Feeding Industry, Technical Bulletin 191, Tucson: University of Arizona Agricultural Experiment Station, 1972

Collins, William S., *Cattle Ranching in Arizona, 1540-1950* National Register of Historic Places Multiple Property Documentation Form, 2002.

Monthly Report, Arizona Crop and Livestock Report Service.

Steely, James W. and Dennis Gilpin, *Lifeline in the Desert; Water Utilization and Technology in Arizona's Historic Era, 1540-1960*. 2006.

Sullivan, Michael, and Carol Griffith, *Down in the Dumps; Context Statement and Guidance on Historical-Period Waste Management and Refuse Deposits* 2005.

Internet Resources

26 Bar Ranch information at http://www.26barranch.com.

==========

2002 Census of Agriculture, Vol. 1, Capter 2: U.S. State Level Data, U.S. Bureau of the Census, www.nass.usda.gov/census/census02/volume1/us/index2.htm.

Abate, Tom, "Better Beef Through Biotech," *San Francisco Chronicle*, 11 February 2001, http://www.mindfully.org/GE/Better-Beef-Safeway.htm.

Arizona Department of Environmental Quality, http://www.azdeq.gov/environ/water/permits/cafo.html.

Arizona State Agricultural Overview—2006, United State Department of Agriculture, National Agricultural Statistics Service, www.nass.usda.gov/Statistics_by_State/Arizona/index.asp.

Bard, F.N. biographical information at http://benttreefarms.com/SouthPoll/Bbreed.html).

Eulaia "Sister" Bourne. http://home.comcast.net/~n.j.dushane/tussock/image16s.jpg.

Thomas E. Sheridan, *Tumacacori Historic Resource Study*, 2004, www.nps.gov/history/history/online_books/tuma/hrs/index.htm.

Thompson, Scott, and Matthew A. Sterner, *Inventory and Documentation of the Irrigation System of the Wellton-Mohawk Division of the Gila Project*, (Tucson: Statistical Research, Inc., 2005): 5-54; www.wellton-mohawk.org/agriculture.html.

State Fact Sheets: Arizona, USDA Economic Research Service, www.ers.usda.gov/StateFacts/AZ.htm.

The Nature Conservancy, http://www.nature.org/wherewework/northamerica/states/arizona/preserves/.

The Grand Canyon Trust, http://www.grandcanyontrust.org/programs/kane/overview.php.

"The Teacher: Eulaia "Sister" Bourne, 1892-1984" at www.cowpuncher.library.arizona.edu/teacher.htm.

USDA Economic Research Service, Annual and Cumulative Year-to-Date U.S. Livestock and Meat Trade, www.ers.usda.gov/Data/MeatTrade

U.S. Environmental Protection Agency, Region 9: Animal Waste, http://www.epa.gov/region09/animalwaste/arizona.html.