

Landholding Systems and Resource Management in the Sky Island Borderlands

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***Abstract**—The Borderlands region of the Madrean Sky Island Archipelago provides an excellent opportunity to compare a variety of landholding systems. During the past four centuries, landholding has been regulated by diverse systems that vary from the customary land distribution practices of native peoples to formalized written land laws imposed by the nation states that currently regulate land ownership and use. The following very informal review of landholding systems is intended to provide historical context for current scientific studies. Hopefully it will initiate a discussion of the relationship between land tenure, custom, and the management and consumption of natural resources.*

This discussion focuses on three “Borderland” valleys that extend across the present boundary between the United States and Mexico. Two of the valleys, the San Pedro River Valley and the San Simon/San Bernardino Valley, connect Arizona and Sonora, while the Animas/Playas Valley crosses between New Mexico and Chihuahua. With roughly south-north orientations, these montane valley systems have served as corridors for the movement of flora and fauna for many millennia, resulting in exceptional biological diversity.

Throughout the Borderlands, “Sky Island” mountain ranges abruptly emerge from “desert grassland seas.” The vast, treeless expanses of grass, in turn, contain occasional watercourses, where riparian corridors provide a greater abundance of water, shelter, and biodiversity than can be found on the surrounding plains. These corridors proved to be the most attractive locations for human residence during the area’s approximate 14 millennia of human settlement. During this lengthy prehistory, a remarkable variety of customs and practices must have been used to regulate settlement patterns and access to resources, and most of them will remain unknown. For the past four centuries, however, we are fortunate to have specific observations and recorded regulations for the systems that determined landholding and resource allocation in the Borderlands.

Today, the Borderland valleys contain a patchwork of landholding arrangements, demarcated by multiple jurisdictional and political borders. National, state, and county or *municipio* borders, as well as borders between private and public lands, communal and individually owned properties, wilderness areas and those with multiple-uses cut across the valleys. The four-century development of this geographical, political patchwork provides an unusual opportunity to consider the relationship between different land tenure systems, land use practices, cultures, and their consequent ecological impacts. Since the 1600s, diverse Native American groups, the Spanish Empire, the nation of Mexico, and the United States in its territorial and statehood phases have established landholding systems and resource regulations. Compliance with regulations occurred to a greater or lesser degree, according to the customs of the time

and place. Impacts from the wide range of landholding regulations have been as diverse as the systems themselves. Impacts associated with particular landholdings can be separated into those that are intensive in restricted locations and extensive throughout the entire region. During the past four centuries, the most extensive land uses in the Borderlands have been associated with livestock, and much of the following discussion focuses on landholding associated with this use.

Native Landholding Systems at Contact

During the 17th century, Spanish military and church personnel recorded their perceptions of the native groups who resided in the Borderlands. Settled, agricultural peoples were found only on the San Pedro River, living in reed and pole houses in *barrio* settlements (so small they could not be called villages) scattered at irregular intervals along the river, each *barrio* having a system of irrigation canals. Inhabitants wore cotton clothing, *gamusas* (dressed buckskin), and decorated themselves with feathers and semi-precious stones. Archaeological excavations support the Spanish assumption that the river settlements were semi-independent and relatively peaceful. Cultural remains indicate that residents produced manufactured items and traded with distant peoples. Spaniards identified these natives as Sobaipuris, speakers of a Piman dialect. They lived on the eastern boundary of the region known to the Spaniards as the *Pimería Alta*, the land of the upper Pimas.

The orderly farm plots of the Sobaipuris produced a surplus of beans, maize, and squash. Farmers cooperated in the construction of irrigation canals, and shared the waters from the river’s perennial flow, indicating that residents and leaders of the settlements had developed an organized method for determining rights to the fields, delivery of water, and proprietorship of the produce. The Sobaipuris apparently occupied their farm communities on a yearlong basis, although a community-based system for occasional relocation of entire

agricultural settlements for safety or resource management was also in place.

East of the San Pedro more mobile native groups occupied the uplands. These largely non-agricultural groups hunted, gathered, sent out raiding parties, and lived seasonally in *rancherías* (encampments). Initial Spanish military reports give prominent mention to the Janos and Jacome, but with time, Apaches emerge the dominant group, and their territory came to be called the *Apachería*. The Borderlands portion of the *Apachería* was home to three bands of Athabascan-speaking Chiricahua Apaches. Each band occupied a separate territory and bore a separate name. The bands were in turn divided into several independent local groups – the units that had the greatest social and economic significance for Apaches.

Local groups recognized non-hereditary leaders, who determined movements and resource allocation in conjunction with other group members. They established headquarter encampments in mountain strongholds or in locations with good resources throughout the Chiricahua, Huachuca, Sierra San Luis, Sierra de la Hacha, Animas, and other ranges. The headquarter encampments might be abandoned in the event of an epidemic, enemy encroachment, depletion of the water, grass, fuel, or food supply, or degradation of the site through lengthy occupation. The local groups remained in their *rancherías* or revisited them on a regular basis and considered them home. These resource management practices, which provided for recovery through non-use, formed a rational, if less visible, form of landholding than that employed by the Sobaipuri.

Although occupation and ownership are not coterminous, it is clear that in a cultural system that does not incorporate written regulations, customary usufruct rights can be equivalent to property rights. Occupation, albeit seasonal, bore the implications of ownership.

Spanish Missions, Presidios, and Land Grants

Spanish presence in the Borderlands began during the late 17th century, with the establishment of missions, *visitas* (mission visiting stations), and *presidios* (military garrisons) in the San Pedro Valley portion of the *Pimería Alta*. Penetration into the *Apachería* consisted largely of military expeditions, the distribution of range cattle, and the establishment of a ranch and short-lived presidio at the *cienea* of San Bernardino. During the entire period of Spanish control (1680s-1821) the Borderlands region remained a sparsely populated frontier of shifting alliances and changing settlement patterns, dominated by Native American groups. Nevertheless, Spaniards imposed new forms of spatial reorganization on the indigenous populations that had lasting consequences.

The major Spanish imperial institutions, the church and the military, cooperated in accomplishing overlapping objectives. Members of religious orders staffed presidios and provided consolation to soldiers on military expeditions and army personnel accompanied missionaries when they established new missions. Jesuits supervised the Borderland missions until the order was expelled from the new world in 1767, after

which time the missions were taken over by Franciscans. Each mission district had a *cabecera*, an administrative headquarters usually located at the largest native village. In addition, the religious order set up several *visitas* at smaller villages, where missionaries periodically said Mass. After conversion to Catholicism, the mission system's second most important goal was the incorporation of native peoples into the imperial economy. This was accomplished by concentrating dispersed native settlements into compact Spanish-style villages, where natives could be acculturated and their labor could produce a marketable surplus. These nucleated mission communities were called *congregaciones* when they were established for Indians who already resided in villages. *Reducciones* were nucleated communities established for Indians who lived in dispersed settlements. Both community forms radically changed native settlement patterns and concentrated population far more than was customary for any native group in the Borderlands region. Indian *gobernadores* acted as agents for the missionaries, and were invested with Spanish civil authority.

Missionaries acted as agricultural extension agents, distributing livestock, seeds, rootstocks, and farming implements to their charges. In the artificially created pueblos, missionary and military personnel attempted to restrict seasonal migrations for gathering and hunting and to extract extra labor for commodity production, exactions that proved to be unpopular, and, more importantly, unhealthy. Despite repeated importations of additional native residents to the mission settlements, native populations continually declined, a result of vulnerability to malaria and other European diseases to which natives had no immunity. As a consequence of declining population and increased Apache raiding, in 1762-63, the Sobaipuri relocated from the San Pedro Valley to the Santa Cruz Valley, after which time there were no nucleated Piman settlements along the San Pedro River, although a few Sobaipuri may have continued to reside in the area.

Presidios (military garrisons) were intended to provide dual services – military protection and settlement of the initial Spanish *vecinos* (citizens) in frontier areas. As an inducement to settle in dangerous or otherwise undesirable locations, presidio captains were authorized to issue soldiers small grants of land, house lots, and garden plots, and soldiers were encouraged to bring families with them. Although the dual scheme of protection and settlement proved effective elsewhere, the Borderland presidios failed to meet either military or settlement objectives. The garrison on the San Pedro moved three times, seeking an unexposed, healthful location that would effectively block Apache incursions. The garrison finally retreated to Santa Cruz, Sonora, where the small farming village still bears the name of the presidio today. The ranch at the San Bernardino *cienea* functioned as a presidio from 1775 to 1780, after which time the garrison was recalled to its original site at Fronteras. Immediately south of the present international boundary, the Spanish army constructed massive adobe buildings and a walled compound, subsequently used as ranch buildings. The removal of the presidios from the Borderlands coupled with relocation of the Sobaipuri Indians left this portion of the frontier even more open to Apache control.

Locations of the Presidio on the San Pedro

San Felipe de Jesús Gracia Real de Terrenate	San Mateo Canyon, near the plains of Terrenate, south of present international border near the San Pedro River	1741-1775
Santa Cruz de Terrenate	San Pedro River, near the visita of Santa Cruz de Gaybanipitea, near Faribank	1775-1780
Santa Cruz de Terrenate	Las Nutrias, south of present international border	1780-1787
Santa Cruz de Terrenate	Santa María Suamca, present Santa Cruz, Sonora	1787-

The third landholding scheme employed by Spaniards to populate the frontier was the distribution of large grants to persons with the financial capability to make the land productive. The distribution of land grants followed a set procedure. The individual desirous of receiving the grant petitioned the King of Spain for a specific parcel of land in the public domain – the King’s land. After a formal survey, an auction was held, and the grant was issued to the successful bidder, usually the individual who requested the land be granted. Formal title to the land followed at a future date, a process that often took up to a decade. Grantees were expected to introduce agriculture, import livestock, and increase frontier population by settling farmers and *vaqueros* on the grant. A grant for *ganado mayor* (large livestock, such as cattle, horses, or mules) consisted of four *sitios*. Equal to a square league (one league is equivalent to 2.6 miles), one sitio contained approximately 4316.32 acres, and a grant for a four-sitio *estancia*, or cattle ranch, contained nearly 17,000 acres. All grants were, of course, unfenced.

During the Spanish period, the Borderlands had few significant *estancias*. José Romo de Vivar, *teniente alcalde mayor* (highest district official) of the Bacanuchi district, operated two of the first big ranches in the Borderlands, one near Cananea in the San Pedro watershed and the other at San Lázaro on the Santa Cruz River. Rancho San Bernardino at the cienega of that name has more obscure origins, although it was considered to be an *estancia* and cattle had been distributed on the ranch before it was converted into a presidio.

During the Spanish period, land grants in the Borderlands failed to extend the limits of the frontier or increase its population, but they did meet Spanish imperial goals for increasing resource production. Even though it became too dangerous for the grantees or their workers to reside on the grants, the livestock they distributed on them multiplied. By the mid 18th-century, various *estancias* in Sonora had 20,000 to 40,000 head of cattle and up to 100,000 head of sheep. Father Ignaz Pfefferkorn reported that herds expanded to such an extent that livestock flooded local markets and devaluated prices. In addition, the Spanish land grant model, followed by the independent nation of Mexico, had lasting impacts for both Mexico and for the portions of northern Mexico that became part of the United States.

Mexican National Period: Land Grants

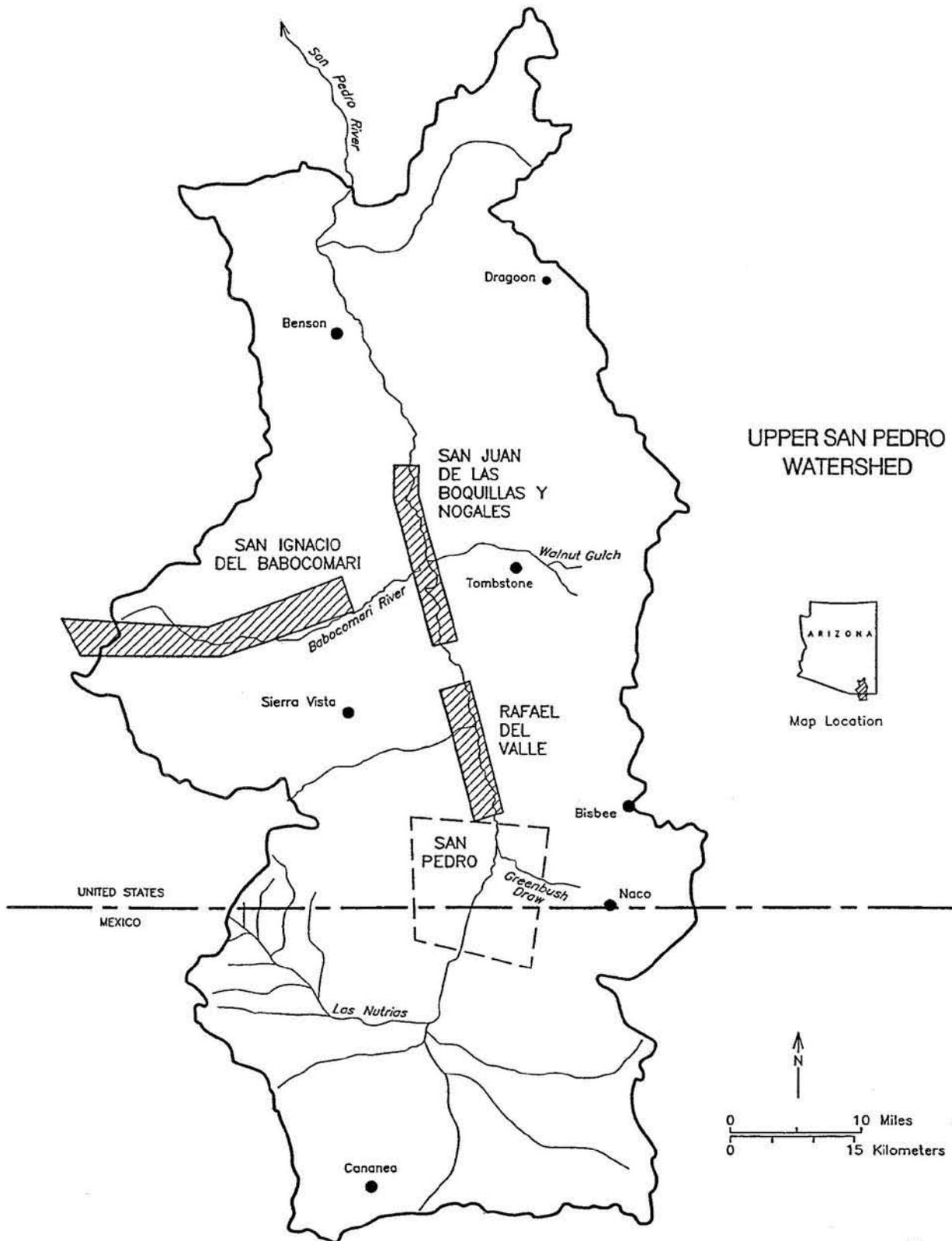
Following Mexican independence in 1821, the new government continued the Spanish land grant system with few alterations. In the San Bernardino Valley, the land grant at

the San Bernardino cienega was initiated during the Spanish period but issued during the Mexican period. In December 1820 First Lieutenant Ignacio Pérez of the *compañía volante* (flying company or mobile squadron) of Nueva Vizcaya (later Chihuahua) applied to the King of Spain for four sitios of land in the “depopulated place” of San Bernardino. The survey, ordered in February 1821 and conducted in April 1821, was carried out while 20 soldiers from the Fronteras presidio protected the survey party from Chiricahua Apache raids. In March 1822 Pérez bought the grant at auction for 90 pesos per sitio. During the process of the application, survey, and auction, Mexico had become an independent nation.

Pérez was a member of the family that owned the valuable mines at Cananea and was married to an Elías, one of the most important and powerful landowning families in Sonora. To stock the Rancho San Bernardino, Pérez purchased 4,000 head of cattle from the missionary at Tumacacori Mission on the Santa Cruz River, but neglected to pay for the livestock, a debt that was later made good by a relative in the Elías family. After 32 years of ranch operation in the Perez family, the Gadsden Purchase incorporated approximately one-third of it into U. S. territory. The new international boundary cut directly across the property, which later became famous as the ranch owned by Cochise County Sheriff John Slaughter.

The San Bernardino watershed contained a second land grant. In July 1831, Juan, Rafael, and Ignacio Elías González, relatives of Ignacio Pérez’s wife, petitioned for the Agua Prieta grant (18 sitios and 12.5 *caballerías*), land that incorporated the spring of that name on the international boundary. The petitioners justified the unusually large request, saying that their cattle strayed to the “four points of the compass,” were already grazing as far as the Chiricahua Mountains and required additional forage. When the international boundary was established following the Gadsden Purchase, most of this grant remained in Sonora.

The majority of the Borderland grants were in the San Pedro watershed. On the Sonoran side of the present boundary, a number of powerful wealthy Sonoran families held grants to some of the most fertile, well-watered grasslands in northern Mexico. Several of the grants extended into the adjacent Santa Cruz River watershed. José Romo de Vivar and his descendants owned the La Cananea, El Alamo de Sevilla, and Cuitaca grants. José María Arvallo and his family held title to grants at Los Nogales and Ojo de Agua de Arvallo, the headwaters of the Sonora River and the main water supply for the Cananea mines. Vicente Mariscal, Guillermo Andrade, and Doña Ignacio Pérez de Urrea held title to the *demasías* de San Bernardino (the “over-plus” lands or lands into which it was assumed the livestock would spread). J. Jesús Merino



LAND GRANTS IN THE SAN PEDRO VALLEY, later became largest area ranches

held title to the hacienda de la Saucedá and Filomeno Suárez to Las Nutrias, one of the sites of the former Spanish presidio. Members of the Elías family held title to the demasías de San José de Heredia. William C. Greene, developer of the Cananea mines, later incorporated many of these grants into his Sonoran ranch holdings.

When the Gadsden Purchase boundary was established, five of the San Pedro land grants fell on the U. S. side of the border, all on a major watercourse, either the San Pedro or the Babocómari. The Court of Private Land Claims, a special court established in 1891 to adjudicate the complicated titles, approved three of the five grants. Moving downstream along the San Pedro, the first of the grants, the San Pedro grant, straddling the international boundary, was property of the Elías González family, whose claim was recognized in Mexico but not in the United States. Moving downstream, the next grant, the San Rafael del Valle, was issued to Rafael Elías González, whose descendants sold it to members of the Camou family of Hermosillo, who in turn sold it to William C. Greene. The next grant downstream, the San Juan de las Boquillas y Nogales (Saint John of the Little Springs and Walnut Trees), had an irregular configuration, five-and-a-half leagues long and three-quarters of a league wide, extending along both sides of the San Pedro River from present Charleston to four miles south of Saint David. The grant was issued in 1833 to Captain Ignacio Elías González, former commander of the Tubac presidio and a cousin of Rafael Elías, owner of the San Rafael del Valle and San Pedro grants, immediately upstream.

The San Ignacio del Babocómari grant, west of the Boquillas grant, was surveyed in 1827 and granted in 1832 to two petitioners, Ignacio Elías González and his sister Eulalia Elías González, a woman rancher who actually resided on the grant and ran the ranch. Together they received eight sitios, approximately 35,000 acres. Six of the sitios had running water and two were dry. The grant contract included a three-year abandonment clause and stipulated that the boundaries be marked. The Elías family constructed a fortress-like adobe compound over an acre in size, surrounded by a high adobe wall with round lookout towers. According to information later given to boundary surveyor John Russell Bartlett while traveling through Sonora, this grant was stocked with 40,000 head of cattle that grazed throughout the unfenced valley. Within two decades the ranch buildings became romantic ruins that, along with the cottonwood-lined creek and the sacaton stands at the cienega, impressed many later visitors.

The Tres Alamos communal land grant, the farthest downstream, was proposed twice but never issued. Yet it may be the most interesting of all the grants. Had it been issued, headquarters would have been at Tres Alamos (north of Benson) and the grant would have contained 58 sitios extending from the Boquillas grant on the San Pedro northward to the Gila River, east to the Cobre Grande mines in New Mexico (near present Silver City) and west to the common lands of the Tucson Presidio. Settled in prehistoric times, the wide floodplain at Tres Alamos was farmed by Spaniards and Mexicans. While the Spanish peace program was in place, Manso Apaches, “tame” Apaches from Aravaipa who had settled at the Tucson Presidio, worked fields at Tres Alamos, protected by presidio soldiers. In

1831 Leonardo Escalante submitted the first application for the Tres Alamos grant on behalf of eight *empresarios* (promoters). The Congress of Sonora authorized the grant, but settlers never materialized and no title was issued. A second application, in September 1852 – after the Mexican War ended but before the Gadsden Purchase – also failed to produce the 100 Catholic families in residence within eight years. Three decades later, the fact that title had never been issued, did not deter California land agents from spending large sums of money in an effort to validate the grant and uproot numerous American homesteaders and “squatters” who had settled there in the interim.

The land grant system was designed to transfer *terrenos baldíos* (vacant lands) belonging to the government – originally the King’s land and later Mexico’s unoccupied public domain – to private landowners. Grantees were expected to have experience, financial capacity, and political power, and to be able to stock the grant with livestock, settle it with farmers and vaqueros, create the necessary infrastructure, provide protection from hostile Indians, and render the land productive. The system concentrated property in the hands of a few powerful families. Land grants fulfilled the goals of the system in part. Grantees promptly distributed livestock on the grants, often a full decade before receiving title – a lengthy process that took place in distant Spain or Mexico City. The livestock thrived and rendered some profit to grant owners. Settling the land, however, failed almost entirely in this portion of the northern frontier. By the 1830s, when the Mexican government could no longer provide funding for frontier military protection or the Apache peace program, raiding became so intense that most land grants were abandoned.

After the Gadsden Purchase

Indian Reservations

The incorporation of the northern portions of Sonora and Chihuahua into the United States through the 1854 Gadsden Purchase initiated the present checkerboard pattern of multiple boundaries. It also introduced new forms of landholding. During the first two decades of United States control, Apaches maintained strongholds throughout the Borderland region and prevented significant new settlement. In Sonora, population in beleaguered villages near the new border dwindled. In the previously unpopulated portion of Arizona Territory a few adventurous individuals, many of them rustlers or outlaws, took up informal land claims largely without legal sanction. These non-Indian intrusions into their homeland infuriated Chiricahua Apaches. Between 1854 and 1872 hundreds of skirmishes took place between Apaches, the military, and non-Indian settlers and travelers, both north and south of the border. The boundary remained a largely unmarked political line, particularly invisible to the region’s native inhabitants.

In 1872, a treaty negotiated by the Chiricahua Apache leader Cochise and Brigadier General Oliver O. Howard ended some of the worst fighting and led to the establishment of the Chiricahua Reservation. The reservation included much of the homeland of the Chokonen band of the Chiricahua Apache nation and incorporated the entire southeastern corner of Arizona

Territory, extending from the New Mexico border to the Dragoon Mountains and from the international boundary north to the Overland Mail route, near present Interstate 10. Agent Thomas J. Jeffords, a trusted friend of Cochise, moved reservation headquarters three times – from the Sulphur Springs, to the San Simon Cienega, to Turkey Creek on the west side of the Chiricahua Mountains – seeking a healthy location free from malaria and distant from rapacious white traders who dealt in illegal liquor and arms. In June 1876 shortly after Cochise's death, a presidential order terminated the reservation, and soldiers from Fort Bowie marched its residents to the hated San Carlos Reservation. Hostilities continued until the 1886 surrender of Geronimo and his small group of renegades, who refused to stay at San Carlos.

The Chiricahua Reservation briefly extended the Apache traditional form of landholding, a system that allowed greater seasonal movement and the maintenance of a more communal economy. Temporary continuance of that system, however, depended on management by U. S. government agencies. The termination of the Chiricahua Reservation opened the way for the first big influx of non-Indian settlers.

Public Land: Preemption and Homesteading

During the nineteenth century, the federal government attempted to achieve a number of democratic objectives through its administration of the public domain. Elements of public land law were designed to populate the frontier, encourage westward movement, and distribute inexpensive land to *bona fide* settlers. The General Land Office (GLO), the administrative agency for public lands, oversaw the survey of the public domain into a pattern of rectangular townships, each containing 36 sections (square miles). As restless Americans moved west, the GLO followed, opening branch offices and conducting surveys as requests for surveys came in.

The transfer of land out of the public domain was accomplished by a variety of means. Public lands could be purchased through cash sale, after the nearest land office had conducted a township survey, determined the price per acre, and established the size of the parcels to be sold. Land could also be acquired through purchase of public land "scrip," transferable land certificates issued in lieu of land as payment for government or military service. Payments in land scrip were frequently issued to veterans or their widows, who sold them to land speculators. Railroad "lieu lands," larger parcels of land issued to railroad companies to support the construction of railroads across the continent, could also be purchased from railroad companies or speculators. States and territories also had land available for sale or lease, land that had been transferred from the public domain through the GLO. Territories received two sections in each township to be used for support of institutions and education. When the territory became a state, two more sections per township were granted for the same purposes.

The majority of the first wave of Borderlands settlers "squatted" on public land, intending to acquire property through "squatters rights," entitlements specified in a series of preemption laws designed to legalize existing illegal land occupation.

Throughout frontier America, thousands of pioneer settlers had developed farms and built homes on land they did not own. First codified in the Preemption Act of 1841, the acts underwent many reforms because speculators often used preemption as a means to acquire large tracts of land. The preemption system never fully accomplished its goal of legitimizing existing, informal occupation of unsurveyed public domain land by *bona fide* settlers.

The homestead acts allowed settlers to claim homesteads and acquire title to land in surveyed townships. Between 1862 and 1916, a series of acts and amendments to existing homestead acts attempted to stimulate legal settlement on the unoccupied public domain. Patenting the claim, or acquiring title to the property, depended on compliance with a set of regulations. Some homestead acts required that the claimant pay fees, or "prove up," at the end of period of residence, others required an inspection to verify that claimants had fulfilled the requirements of the act. The Homestead Act of 1862, the first act in the series, accounted for the majority of claims in the Borderlands. It allowed individuals 21 years of age to claim up to 160 acres of public land, after payment of a filing fee. To acquire title, a homesteader had to establish residency within six months of filing the claim, reside continuously on the land for five years, and cultivate a portion of the land during the final four years. The act was amended several times, increasing the acreage allowance, easing residence requirements, and generally making it easier to acquire a homestead.

In the Borderlands, successful patents began after the 1870s. Homesteading peaked during the "dry farming craze" of the 1910s. The most common homestead entries were made under the Homestead Act of 1862, the Stock Raising Homestead Act of 1916, and the Dry Farming Homestead Act of 1909--in that order. The Forest Homestead Act of 1906 was used less frequently because it only applied to arable acreage within national forests. The Enlarged Homestead Act, commonly known as the "Dry Farming Act," doubled the maximum size of claims to 320 acres, required the cultivation of non-native grasses, and allowed claimants to be absent for up to five months per year. The Stock Raising Homestead Act allowed claims of up to one section (640 acres) of non-irrigable land. This act recognized the need for larger acreage in arid areas and was designed to promote settlement of "remnant" land, valuable chiefly for forage. It required that the claimant construct improvements in the form of fences and wells, equivalent to an investment of \$1.25 an acre.

The homestead laws reflect the American philosophy that each citizen has a natural right to a share of the country. The first Homestead Act facilitated acquisition of the mythical quarter section (160-acre) farm, the ideal acreage to create a Jeffersonian utopia of small farmers. Although the homestead laws reflected fine ideals, they were based on an inaccurate understanding of climate. As settlement proceeded westward, it became evident that the 160-acre farm was not viable in more arid regions. Ambiguities in the regulations permitted unintended uses and gross abuses of the laws. Adjustments to existing acts and several entirely new homestead acts attempted to remedy flaws in previous regulations. But none of the adjustments made the system work entirely as it was intended.

Considerable “bending of the law,” if not outright fraud, accompanied the acquisition of homesteads, as well as the maintenance and use of homesteads. Complicated land laws gave shrewd businessmen distinct advantages over simple homesteaders. Land speculators often used “dummy entrymen” to file homesteads on their behalf, then acquired the homesteads through default on mortgages. Homesteaders themselves abused the homestead laws. They employed loopholes in the laws that allowed them to benefit from use of the land, without intending to secure title. Applicants could use (or abuse) the water, soil, and forage on the land from the time they filed their application until the time they were supposed to “prove up” (five years under the Homestead Act) then walk away from the homestead, without any costs other than the filing fees. In other situations, claimants could continue to use the land and its resources on a homestead for which the application had expired unnoticed.

Promotion of settlement and the distribution of inexpensive land appeared to uphold democratic principles, but unintended applications of homestead laws could have decidedly undemocratic consequences. Along the Arizona/New Mexico boundary, the most common unanticipated use of homestead laws was the creation of large ranches by amassing multiple small homestead parcels. Large landowners, often ranching corporations that owned land in the region, made arrangements with cowboys or ranch workers to file homestead claims. As soon as the properties went to patent, the ranch corporation would purchase the titles through pre-arranged agreements. In addition, large landowners could surreptitiously sponsor township surveys to hasten the opening of an area to homesteading. Legally, actual residents of an area could request that the township in which they lived be surveyed so they could homestead and acquire title to the land. In such cases, requestors were responsible for paying surveyor fees. During the 1880s, township surveys cost between \$600 and \$800, approximately three to four times the average annual salary of most homesteaders, cowboys, or farm workers. Sponsors of many township surveys at the southern end of the Animas Valley, for example, have Hispanic names, which do not appear on subsequent homestead applications. The requestors in this case may have been cowboys in the employ of one of the area’s large corporate ranches. If so, they could not have paid for the surveys, and payments must have been supported by their employers.

In the arid Southwest, the fundamental flaw of the homestead regulations was the inadequate size of homesteads. The Enlarged Homestead Act of 1909, designed to encourage non-irrigated farming, had particularly unfortunate results. Passage of this act coincided with the promotion of scientific dry farming methods by local agricultural extension agencies and the onset of two decades of heavier than normal rainfall. Although many dry farmers produced surprisingly high yields of forage crops and pinto beans without irrigation, when drought returned to the Borderlands area in the early 1930s, the majority of the dry farms collapsed. Even the Stock-Raising Homestead Act, which provided the largest amount of land, one full section per claimant, was insufficient for raising livestock. In the Borderlands, one section of non-irrigated grazing range might support 10 to 16 head of mother cows with calves

yearlong, without damage to native grasses and other range resources. Stocking rates depended on the type and condition of the forage. To support a family of four, a homesteader needed a minimum of 150 head (requiring some 15 sections of land) making it necessary for settlers to utilize the public grazing lands to accommodate adequate herds.

In the Borderlands, homesteading did not fully accomplish the democratic or demographic goals inherent in the acts. Approximately one quarter of the land claimed under the homestead laws was returned to government ownership, after claimants either relinquished their claims or failed to “prove-up.” Yet, despite the fact that most settlers could not make a living from homesteading alone, the acts succeeded in bringing population to the Borderlands and created dispersed rural settlements that lasted for several decades. These settlements were composed of several agricultural homesteads, not enough to constitute a village, but with enough population to warrant a school and/or post office, within walking distance. In New Mexico these existed at Cloverdale, Middle Animas, Walnut Wells, Guadalupe Canyon, and near the Box Schoolhouse, and in Arizona at Babocomari, Bean, Hereford, and Palomas. By the end of World War II many rural residents had become dissatisfied with the hardships and isolation of rural life. During the next decade, rural out-migration led to the gradual death of most dispersed agricultural settlements.

The legacy of Borderlands homesteading is still visible. In the Animas Valley, for example, outlines of former dry farms are still noticeable, for their scanty clumps of invasive grasses and patches of bare ground. Crumbling adobe houses along the creek near Middle Animas attest to failed homesteads. Settlements that grew into vigorous Borderland towns were those with sources of income in addition to agriculture, most often mining or transportation, as was the case with Bisbee, Animas, Hachita, or Rodeo. Third and fourth generation descendants of some of the Borderlands’ most energetic, persistent homesteaders still live on family farms in the Animas or San Simon valleys, and others run family cattle ranches. A significant, unanticipated outcome of the homestead movement was the concentration of land among fewer, larger landholders. Within four or five decades, the majority of successfully patented homesteads had been sold to larger landowners.

Corporate Ranching

Although homesteaders began arriving in the Borderlands at approximately the same time as land agents and wealthy cattle ranchers, smallholders were at a clear disadvantage. During the late 1870s, agents of large cattle operations began purchasing titles and quitclaim deeds to the area’s land grants and initiated litigation to clear the titles. Like their Spanish and Mexican land grant predecessors, the new investors began stocking their properties with cattle long before the titles had cleared the courts.

By the late-1880s, the big ranches that came to dominate the valleys of the Borderlands for decades were all in place. On the San Pedro River, copper magnate William C. Greene bought most of the land grants near Cananea, as well as the San Pedro and San Rafael del Valle grants in Arizona. The Boquillas Land and Cattle Company, a subsidiary of California’s

powerful Kern County Land and Cattle Company, bought the Boquillas grant. The Perrin family, owners of other land grant ranches in Arizona, bought the Babocomari grant. In the San Bernardino Valley, former sheriff John Slaughter bought the San Bernardino grant on both sides of the border. In the San Simon Valley, the San Simon Canal and Cattle Company held title to the cienega and most of the other water sources in the San Simon and the northern San Bernardino valleys. In the Animas and Playas valleys, the Victorio Land and Cattle Company, a subsidiary of Kern County like the Boquillas, owned the majority of the best rangeland.

Investors in the land grant properties included several of the wealthiest, most influential “capitalists” in America. George Hearst, James Ben Ali Haggin, and Lloyd Tevis had investments in the Boquillas and Victorio companies, and Lloyd Tevis’s son was an initial investor in the Babocomari. The three elder men came to California as Forty-niners, made fortunes during the Gold Rush, and were neighbors in one of San Francisco’s most elegant sections. Hearst, a legendary mining tycoon considered to be a “natural prospector” and fine practical geologist, walked alongside his ox team from a small Missouri farm to California. He created a mining empire that included the Silver City and Butte copper mines. Hearst served as U. S. senator from California, ran unsuccessfully for governor of California, and leveraged his ownership of the San Francisco Daily Examiner into the Hearst Newspaper conglomerate. Haggin and Tevis were attorneys from Kentucky, brothers-in-law, and partners in a California land law practice. Haggin, the second largest landowner in California with 450,000 acres of range and farmland in the state’s central valleys, was founder of the Kern County Land and Cattle Company and developer of dozens of irrigation districts. He owned over a hundred mining properties, scattered from Alaska to South America, among them Grant County, New Mexico’s tiny Victorio mine, which rendered little ore but gave its name to the Victorio Land and Cattle Company. Lloyd Tevis, in addition to founding and owning Wells Fargo, was a principal in the California Steam Navigation Company and the Western Union Telegraph Company, and served as president of the southern Pacific Railroad.

The other large ranching investors, although perhaps less famous, were nonetheless knowledgeable cattle growers. The Perrin family owned other land grant ranches. The Paramores and Mercants were famous cattlemen in Texas. John Slaughter gained fame as the sheriff who ran the outlaws out of Cochise County. Investments by such influential men, no doubt, spurred Congress to streamline the inefficient system for validating land grant titles, a process initially conducted by the surveyor general of the territory in which the grant was located, who made recommendations to the U. S. Secretary of Interior, who in turn made recommendations to Congress, where final determination was reached. In 1891, Congress created the Court of Private Land Claims, with an Arizona district headquartered in Tucson. Despite the streamlining, the adjudication process for Arizona land grants lasted until 1904. During the interim, the new land grant claimants stocked their ranches to capacity. Their persistent importation of cattle, first by trail drive and later by railroad, spurred the cattle boom of the 1880s and

1890s and the competitive overstocking that contributed to severe range deterioration.

The land management philosophies of the large ranchers varied considerably. William C. Greene was considered to be one of the most progressive range managers of his time and his descendants continued his management practices. When Greene died accidentally in 1911, his descendants retained ownership of the land grant ranches in Sonora, and the Boquillas Land and Cattle Company bought his ranches on the San Pedro in Arizona. The Boquillas and the Victorio Land and Cattle Company in the Animas and Playas valleys were both subsidiaries of the Kern County Land and Cattle Company. Kern County followed a policy of acquiring large tracts of contiguous private land and eliminating intermediary in-holdings whenever possible. Although the Boquillas and the Victorio operated under separate management, both followed the land ownership policies and management practices of the parent company. By the 1940s, both the Boquillas and the Victorio had adopted more progressive range management practices. Although they employed standard predator control and introduced non-native forage species, both ranches steadily reduced stocking rates. Grasslands in the valleys benefited from Kern County’s ability to implement fast off-take strategies during droughts, when cattle were promptly relocated to the company’s irrigated pasture in California. As a result, when the Boquillas and Victorio ranches were sold during the 1950s, they consisted of large continuous tracts of land that were in relatively good condition.

In contrast, the San Simon Canal and Cattle Company concentrated on buying water sources, made no attempt to purchase tracts of land that connected the waters, and followed a policy of maximizing forage consumption on the intermediate public domain, or “open range.” The result was a checkerboard pattern, in which private property alternated with public land. San Simon Company owners, members of the Merchant and the Parramore families of Abilene, Texas, had stronger attachments to their ranch properties in Texas and eastern New Mexico. James Parramore actively supported the development of the townsite at the Rodeo, New Mexico, a cattle shipping station on the El Paso and Southwestern Railroad, through the sale of lots and donation of property for community buildings, churches, and schools. In the early-1920s, when his son “Doc” Parramore sold off the dispersed private parcels of the ranch, many smallholders and medium-sized ranchers bought land.

A comparison of the ownership and management policies of the Kern County subsidiaries and the San Simon Canal and Cattle Company provides some insight into the lasting effects of land policies enacted between five and eight decades ago. Kern County, through its subsidiary ranch companies, purchased as much private land as possible in the San Pedro, the Animas and Playas valleys. In both areas, the company’s large uninterrupted tracts of private land benefited from range management practices that were better than average for the time. Acquisition strategies of the San Simon Land and Cattle Company left large areas or rangeland available for lease through the Bureau of Land Management, or sale and/or lease through the Arizona State Land Department. Ultimately, the reluctance of the company to purchase large contiguous tracts

of land increased the parcelization in the valley and eventually facilitated sub-division of open space for residential sale. In addition, the land management policies followed by the company, particularly on open range, did little to further resource conservation.

Protecting the Public Domain

Between the 1880s and 1930s, three factors coalesced to create a situation in which Borderlands rangeland resources were abused: the federal government failed to implement regulations for livestock access on the public domain; livestock owners had unrealistic expectations concerning climate variability and the ability of arid land grasses to recuperate from overgrazing or drought; and materials, in the form of fencing and other ranch hardware, were unavailable or economically inaccessible to many settlers and ranchers. A system of competitive overstocking on public lands quickly developed. The individual who controlled a water source attempted to fully stock the range surrounding it to prevent access by his neighbors' cattle. Within three decades of their arrival in the territory, American cattle growers and range specialists recognized that a disaster was unfolding on the Borderlands public domain. In the 1890s, Dean Robert H. Forbes of the University of Arizona's College of Agriculture and other range experts pointed to the San Simon Valley as one of the worst examples of degraded rangeland, erosion, and arroyo cutting in the Southwest.

Contrary to what many individuals in the present livestock industry believe, state and local cattle growers associations in Arizona and New Mexico were among the first to pressure the federal government for stocking limitations and seasonal access to public lands. Demands for better regulation began during the 1890s and continued through the 1920s. Large ranchers were the most vocal advocates for regulation. Henry Hooker, William Bayless and other pioneer ranchers attributed range degradation to unregulated overgrazing. The inability to control livestock movement was a significant source of the problem. Barbed wire became available during the 1880s, but fencing was so uncommon that even portions of the international boundary remained unfenced until the 1930s. On the public domain, it was illegal to erect unpermitted fences, including short stretches of "drift" fence intended to prevent cattle from drifting through mountain passes, crossing territorial boundaries, or moving into locations where they would be difficult to gather.

To address widespread natural resource abuses, Congress passed the General Land Law Revision Act in 1891, giving the president authority to set aside portions of the public domain as timber reserves. For decades, the reserves offered the only form of protection for public lands. Initially, the Department of the Interior managed the reserves, without allowing multiple uses. After 1905, when the Department of Agriculture (USDA) took over the reserves, grazing and other limited uses were allowed. In 1907, "forest reserves" were renamed "national forests," reflecting a philosophical difference in the policies of the two agencies.

The Peloncillo and Huachuca reserves are of particular importance in the Borderlands. In July 1902, the first seven

reserves in southern Arizona were created. Four years later, the Peloncillo Forest Reserve was among the next group established. Created in November 1906, the reserve encompassed the Peloncillo and Animas mountain ranges. It contained approximately 320 square miles, extended across the territorial boundary between Arizona and New Mexico, and was divided into two geographically separate divisions – the Animas Creek District with approximately 55,700 acres and the Peloncillo District with approximately 88,000 acres. Newspapers reported that the reserve was created in order to protect watersheds that were becoming denuded. The Huachuca Forest Reserve, also established in November 1906, had the curtailment of unregulated logging and fuelwood cutting as a primary objective, although grazing regulation was quickly implemented there as well.

During the next 50 years, the southern Arizona/New Mexico reserves underwent a series of consolidations and eliminations that incorporated 14 small reserves into the Coronado National Forest. In 1908, the Peloncillo Reserve became the Peloncillo-Animas District of the Chiricahua National Forest, which was incorporated into the Coronado National Forest in 1916. The forest supervisor's office for the Peloncillo Reserve had been located in Rodeo, New Mexico, a major cattle shipping station in the San Simon Valley directly between the Peloncillo and the Chiricahua ranges, an indication of the importance of grazing in that national forest. When the forest was incorporated into the Coronado, the supervisor's office moved to Tucson. Ranger stations for the Peloncillo-Animas District relocated several times, with locations in Skeleton Canyon (1908-1920), the small homestead settlement at Cloverdale, New Mexico (1920-1933), and finally Douglas, Arizona (1933 to the present). The Animas Creek Division underwent a reduction in 1910, when President Taft eliminated its southern portion along the Mexican boundary. In 1948, the remaining 50,000 acres of the division were privatized in an exchange for forested land in west-central New Mexico. After privatization, most of the acreage in the Animas District was sold to the former allottees. The Huachuca Reserve became a district of the Garcés National Forest in 1908, along with the Baboquivari and Tumacacori reserves, which were also demoted to district status. With headquarters in Nogales, the Garcés was called the "Border Forest," or the "Sneeze-Cough Forest," because the names of its three districts were difficult to pronounce. In 1911 the Baboquivari District was eliminated, and the remaining divisions were incorporated into the Coronado.

When the forest reserves were set up, they offered the only land holding designation that provided a legal means to control natural resource consumption on public lands. Yet several early regulations proved to be contrary to agency goals. In 1906, Congress passed the Forest Homestead Act, which provided for the elimination of non-forested, arable land thought not to be appropriate to a forest reserve. The law permitted claims of up to 40 acres in the ponderosa pine belt, or up to 80 acres in the piñon-juniper zone, after the land had been classified as agricultural and surveyed by Forest Service personnel. Claims did not have to be rectangular and could follow the configurations of the floodplain. The act was intended to support farm production, yet the majority of forest homesteaders wanted

forest homesteads for ranching rather than farming. Since forest claims were normally surrounded by national forest, the homesteader qualified for a Class A Grazing Permit, the most desirable type of permit reserved for private land adjacent to national forests. Inadvertently, the law increased the number of landowners who could apply for grazing permits, contributing to occasional conflict between the agency and permit holders and between permittees themselves. Dozens of grazing permits associated with forest homesteads were issued in the Peloncillo and Huachuca mountains.

The passage of the Taylor Grazing Act on June 28, 1934, ended the open range system of cattle ranching. The act established grazing districts, charged with leasing grazing allotments on the public domain. Preference was to be given to owners of private land or water rights contiguous to the land requested in the lease application. The General Land Office (GLO) in conjunction with the Grazing Service (after 1946, the Bureau of Land Management) administered the allotment system, issuing ten-year leases and setting lease fees according to a formula based on estimated carrying capacity. Twenty-five percent of the lease fees were to be expended on range improvements (fences, wells, windmills, pipelines, tanks) on the leased allotments. To expedite the leasing system, the GLO held public hearings and interviewed ranchers who had previously grazed their cattle on the public domain free of charge. In some areas heated controversies arose between neighbors or between ranchers and agency representatives. In other areas, the allocation of leases went smoothly.

At the time of the Taylor Act, state land commissions in Arizona and New Mexico increased regulation and tightened up leasing systems. Like the GLO, state land commissions gave priority to previous lessees and honored improvements installed on state land at the cattle owners' expense. By the 1940s, state grazing leases were extended from five to ten years. State land departments soon developed the reputation for imposing less rigorous scrutiny than the Taylor Grazing Service, requiring no time limits on the installation of fencing, but providing no monetary or physical assistance for such improvements.

Many ranchers who participated in the transition from open range to regulated grazing stated that resource management improved noticeably. They observed, however, that larger ranches received preference in the distribution of leases and that smallholders were often unable to obtain leases and were frequently forced out of the cattle business.

Sonora After the Revolution

Latifundia and Ejido

William C. Greene, Cananea's copper mining magnate, initially operated his Sonoran ranches through a Mexican company, incorporated in 1901 in Nogales, Sonora. His ranches were estimated to extend for approximately 68 miles east and west along the international boundary and approximately 48 miles southward from the border. After Greene's 1911 death, family members retained his progressive range management policies. The Mexican Revolution (1910-1920), however,

altered the legality and the structure of the Greene landholdings. In 1923, Article 27 of the newly adopted Mexican Constitution codified a major land reform, the primary goal of the ten-year revolution. Under the new Agrarian Code the vast rural properties common throughout Mexico prior to the revolution became illegal. Mexico's *latifundia* (the Latin word describing the great estates of ancient Rome) could now be expropriated for conversion into *ejidos*, (communal or cooperatively held farm and ranch properties) for distribution to the *campesinos* (rural peasants) who worked them. *Ejidos* were to be held in trust as unalienable common property belonging to *ejidatarios* (members of the *ejido*) and their descendants. Management policies were to be determined by a governing council elected by *ejido* members.

Under the new constitution individual landholdings in excess of 10,000 hectares and foreign ownership of property adjacent to international borders became illegal. To comply with the new regulations, Greene family members organized the Ranchos de Cananea, a set of separate but interconnected Mexican companies that held multiple titles to the ranch holdings. It was common knowledge, however, that the vast landholdings were illegal. For three decades, political connections and respect for the Greene family delayed expropriation, but during the early 1950s a federation of Sonoran laborers, peasants, and veterans of the revolution began pressuring for confiscation. After several years of negotiations, a price for the seven ranch divisions and a separate price for the livestock were determined and the properties were nationalized.

The expropriation was so politically significant, that President Adolfo López Mateos came to Sonora in February 1959 to personally deliver the deeds to the seven divisions to the *Ejidos de Cananea*, a conglomerate of *ejidos* with a membership of 585 new *ejidatarios*. More than 250,000 hectares of former Greene lands were redistributed, comprising over 50 percent of the Sonoran portion of the San Pedro basin. Initially, the *Ejidos de Cananea* followed management policies similar to those of the former ranch, despite the new form of land tenure. The size and boundaries of the seven new *ejidos* corresponded roughly to the former divisions. Livestock remained the major economic activity although the *ejidos* increased the acreage devoted to farming, introduced dairying, and initiated several small industries. The Banco Nacional de Crédito Ejidal, an agency of the Mexican Department of Agriculture, administered credit, provided technical advice, and required adherence to stocking rates based on the estimated carrying capacity of the land. With time, however, the overall number of *ejidatarios* and the consequent numbers of permitted livestock multiplied. Members increasingly failed to comply with stocking regulations and range conditions generally deteriorated. The supplemental economic activities attempted on the *ejidos* proved unprofitable. With time, overall political support throughout Mexico for the *ejido* system diminished.

In 1992, the Mexican Congress abrogated Article 27 of the constitution, with profound consequences for property rights, production systems, and the organization of the rural sector. The new Agrarian Code put an end to land redistribution, and offered *ejidos* federally recognized ownership rights to *ejidal* land and the structures upon it. It became possible

for an *asamblea ejidal*, the governing body of an ejido, to modify its property status. With appropriate authorization, an entire ejido could be sold or leased as a unit, or individual *derechos*, rights to parcels of ejidal land, could be sold or leased by individual ejido members, after the parcels have been surveyed and distributed to members. Ejidatarios could also lease their usufruct rights to common lands, for grazing, forestry, or water supply. In addition, the new code ended the prohibition of foreign ownership of land and water rights along international borders.

By the year 2000, approximately 30 percent of the ejidatarios in the San Pedro basin had sold their *derechos*, resulting in the proliferation of undersized parcels of private land among smallholders, whose economic needs dictated that they graze as many animals as possible. Additionally, the parcel owners were no longer subjected to the level of scrutiny previously imposed by the Agriculture Department. The construction of fencing around the small parcels contributed to intense overgrazing in limited areas as well as to the obstruction of wildlife movement through this portion of the watershed. Some researchers state that the results of privatization have been ecologically disastrous.

Observations on Borderland Landholdings

Research for this three-century segment of Borderlands land use history gives rise to several tentative general observations, which relate only to this region. They are presented here in the hopes of stimulating discussion and further study of the wider relationship between landholding, culture, and resource use. First, the region's native peoples appear to have worked out relatively efficient land use systems, the impacts of their occupations limited to specific locations in which intensive use occurred. Second, government landholding policies often failed to achieve the specific goals for which they were intended. Regulations--whether enacted by the government of Spain, Mexico, or the United States--were frequently used to accomplish ulterior ends, producing situations in which well-intended policies had unanticipated, even perverse, consequences. Third, private property, with security of tenure, received better treatment than public land, particularly during the period prior to implementation of public land regulation. Fourth, in the arid ecological conditions of the Borderlands, small agricultural landholdings were not economically viable, and consequently were subjected to more intensive use and harsher resource consumption.

The fifth observation relates to land use on large private landholdings, which, of course, were subject to the predilections of the owners. In the Borderlands, the proprietors of four of the largest landholdings followed management practices considered at the time to be progressive. Yet, despite the owners' diligence in acquiring large, uninterrupted tracts of private land both for economic motives and for preservation of open space, unforeseen circumstances determined different outcomes for the various properties. At the present time, one of the large landholdings (Victorio Land and Cattle Company, later known as Gray Ranch) continues to be a private, protected

working landscape. On another large landholding (Boquillas Land and Cattle Company), the riparian areas are protected and are currently under restoration as the San Pedro Riparian National Conservation Area, while the grassland portions of the same property were mostly sold for development as plated residential sub-divisions near the booming town of Sierra Vista, Arizona. Significant portions of another large property (Babocomari Ranch) are currently being developed as "wild-cat," or informal, subdivisions, subject to lot splits on 40-acre parcels. The remaining extensive but non-contiguous landholding on the U. S. side of the border (San Simon Land and Cattle Company) was sold in parcels decades ago. The largest well-managed landholding in Sonora (Ranchos de Cananea) underwent conversion from private to communal to private property, with unfortunate consequences for its resources.

A final observation is that external forces, often in the form of large infusions of outside capital, have overwhelmed local goals, particularly those related to the land. The interweaving of economic forces with climate variability has had an adverse influence on the retention of family landholdings. Other external forces, however, in the form of national conservation groups, have become surprising allies for some local goals, particularly for the preservation of Borderland landholdings. Local culture and land ethics have occasionally come together to influence property economics, as can be seen in the case of the Malpai Borderlands Group or the region's grassland associations.

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