NAVAJO LAND USE

An Ethnoarchaeological Study

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Chapter 3

The Land and Early Navajo Use

1700–1800

During the seventeenth century, the Navajos were living in Dinetah. That wooded mesa-and-canyon country lies along the San Juan River and its southern tributaries, Largo and Gobernador drainages, in what is now northwestern New Mexico (see Frontispiece). Archaeological and ethnohistorical works on the period show that Navajos lived in dispersed small groups that probably consisted of extended families. They subsisted by growing corn and other crops, hunting, and gathering (see Vivian, 1960, for a review of sources). They also sustained raids, mainly from the Spanish colonists to the east along the Rio Grande, who took Navajo slaves. The Navajos reciprocated in kind, either by retaliating or by taking livestock (McNitt 1972:3–26). At first they seem to have eaten the livestock, just as they would have done with wild game. By about 1700, however, Navajo families were augmenting their farming, hunting, and gathering by raising small herds of sheep and goats (Hill 1940b; Reeve 1958:217). They may also have started to move westward, as they continued to do throughout the eighteenth century, and some settled in the general vicinity of the lease townships.

The move westward may have been the outcome of three sets of conflicts, all responses to Spanish (and some possibly to French) colonial expansion. The first set consists of the Pueblo Revolt of 1680, when the Pueblo Indians drove the Spanish out of the New Mexico Territory, and the Spanish Reconquest of 1692 to 1696, during and after which many Puebloans fled into Dinetah (Reeve 1958). That the first Navajo occupation of Canyon de Chelly (in what is now Arizona) may date to this time (Brugge 1972:95) suggests that Navajos were moving westward, perhaps because the Puebloan refugees were crowding them out of Dinetah, or because they were fleeing the Spanish.

The second set of conflicts consists of Ute and Comanche raids on the Navajos between about 1710 and the 1760s, with arms possibly furnished by the French (Reeve 1958; Sjoberg 1953:77). These raids forced the Navajos to abandon Dinetah. Many moved southward into the Cebolleta Mountains or westward to the Chuska Range and Canyon de Chelly (Ellis 1974:302–306, 489–490; Hill 1940b:396; Reeve 1959:20, 24). During this time, the Navajos and Spanish were at peace (Reeve 1959), possibly because the Spanish wanted the Navajos as a bulwark against Ute and Comanche attacks and therefore restrained themselves from taking Navajo slaves.

The third set of conflicts came about at least partly because the Spanish settlers spread into Navajo territory around Mount Taylor during the 1760s (Reeve 1959:29–39). The Spanish also renewed the slave trade after the Ute–Comanche alliance fell apart during the 1760s, a change that Brugge (1972:97) sees as the main cause of the renewed slaving.

During this period, Navajos settled in the general vicinity of the lease townships. Mid–eighteenth-century Navajo homesites are located a few miles from the townships, to the south at Manuelito on the Rio Puerco of the West and to the southeast at Rock Springs. During the eighteenth century, Navajos also built antelope-hunting corrals a few miles west of the lease townships in the Black Creek Valley. These corrals

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suggest that settlement was sparse, for otherwise the sheep would have outcompeted the antelope (Navajo Tribe, Correll Collection [CC] 1962: S-ULC-UP-P, Q, R, AA, OO). Other sites several dozen miles west of the lease townships (near Nazlini and Klagetoh) date to the mid-eighteenth century. The masonry fortifications that make up these sites show that westward migration did not insure the Navajos against attack (Bannister, Hannah, and Robinson 1966:7–8; Brugge 1972:97). Navajos, however, evidently did not settle in the lease townships themselves during this period. The archaeological studies of the lease (Eck 1981; Eck, Boyer, and Kelley 1982; Hartman 1977; Koczan 1977) offer no clear evidence of Navajo residence until the late nineteenth century.

The townships nevertheless would have offered most of the resources that Navajos needed to survive. Farming was important to Navajo livelihood at the time. People would have sought farming sites in places where they could also graze small herds of sheep and goats, find water and firewood, and hide during raids. The lease townships cover a tract between 6500 and 7200 feet in elevation that is rugged and rocky except for the east side. Mixed sagebrush-grassland carpets the broad, low-lying valley bottoms and is interspersed with piñon and juniper woodland in the uplands. Moisture today averages 12.6 inches a year, between a third and a half of which falls as snow (Dames and Moore 1974:37) and is therefore adequate for dry farming. So is the growing season, which usually exceeds the 120–130 frost-free days that corn requires (Knight 1982:52–53). Wide expanses of clay loam with adequate slope for drainage offer cultivable land between the bigger arroyos and outcropping mesas (Nelson and Cordell 1982:872–873).

Sage-grass forage for stock also abounds in the three major drainages of the townships: Tse Bonita Wash, a southwest-flowing tributary of Black Creek that heads north of the lease; Defiance Draw, separated from the Tse Bonita Wash to the west by a yellow sandstone spine and draining southeast into the Puerco; and the Eastern Flat, an eastern tributary of the lower Defiance Draw. The lease also nips off a small side canyon of Black Creek for a bit of a fourth drainage (see Figure 3.1). The townships, then, offered cultivable land, forage, hiding places, wood, and water.

In summer, however, surface water in the townships is scant. No springs or streams are permanent, although layers of water-bearing sandstone and shale underlie the townships. Seepage is mainly confined to the winter, as snow melts and the low temperatures prevent the quick evaporation that occurs in summer. The yellow and brown sandstone crops out in the uplands as caprock with shale underneath or as steep-sided ridges, and the gray shale crops out as badlands. Shales also underlie the lowland sage-grass plains. Overall, the townships dip to the southeast (Dames and Moore 1974:42, 45, 47). Water seeps from the exposed sandstone–shale contacts along the sides of the ridges at various elevations and collects in playas on the flats. The general southeastward dip probably affords seep-fed tributary drainages in the southern and eastern parts of the townships' larger catchment basins than those to the north and west. It also gives the lower Defiance Draw and Eastern Flat more surface water than the Tse Bonita Wash and upper Defiance Draw. The Tse Bonita Wash, however, is longer than the other two drainages. It heads in the foothills of the Chuskas and seems to have more subsurface flow than do the other two, so that one can tap more water by digging shallow wells in its bed.

On the other hand, nearby Black Creek would have run continuously during the eighteenth century before irrigation projects, dams, and wells absorbed some of its flow. From its source about 35 miles northwest of the lease townships, it traversed broad grasslands between the pine-topped red sandstone "haystacks" on the east and the timbered Defiance Plateau on the west, crossed the meadows of Oak Springs, and descended through a canyon to the Rio Puerco of the West, also a permanent stream. People could have farmed near hiding places along the edges of the Black Creek and Puerco valleys and probably would not have needed more range. The lease townships, therefore, may have attracted Navajos of the time only for hunting and gathering. Distance from concentrations of people would have encouraged deer in the area, and perhaps even antelope in the sage-grass flats where two undated antelope corrals still stand.

1800–1864

Hostilities between the Navajos and successive colonial regimes escalated after 1800 (Reeve 1960:235) and especially after 1818 (Brugge 1972:99). The

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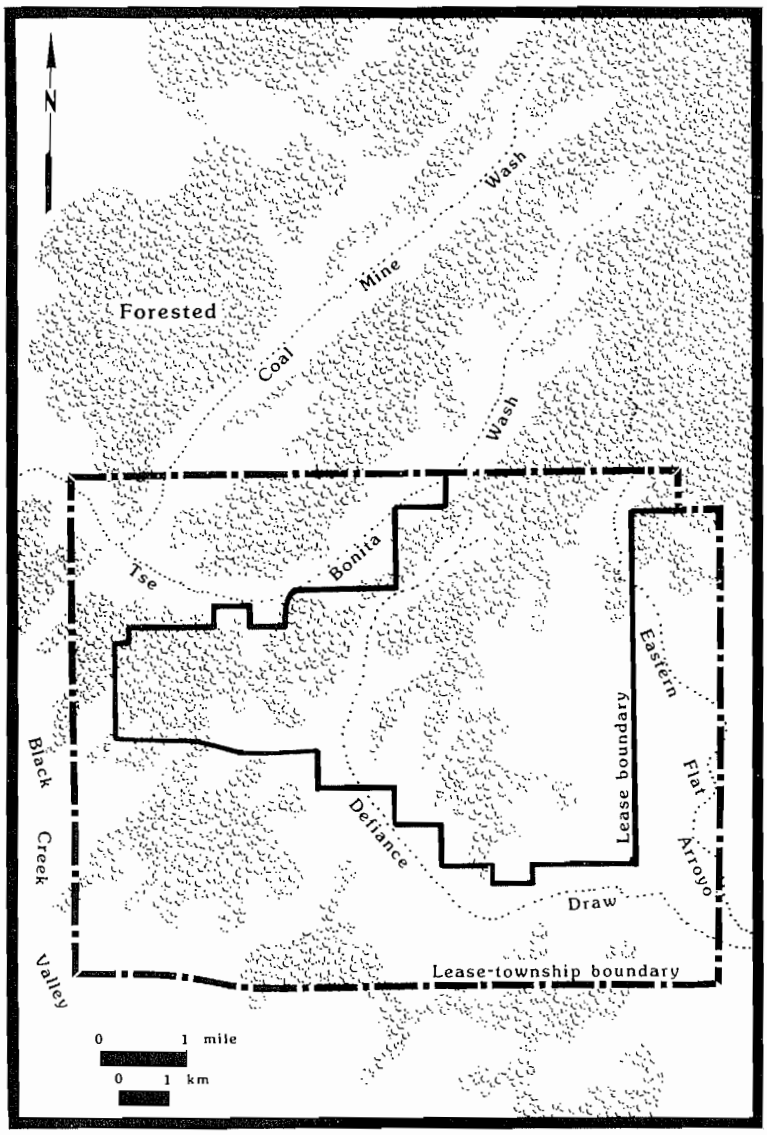

Figure 3.1 The lease townships and their drainages.

Spanish and Mexican colonial governors sanctioned slave raids, and the practice continued after the United States took over the New Mexico Territory in 1848 (Young and Morgan 1952:3). Colonial governors also dispatched military expeditions into the Navajo country. On the Navajo side, small groups of malcontents mounted some raids for livestock and, sometimes, slaves, but large groups evidently also raided the colonials (Reeve 1971:226).

Colonial slaving and military adventures were not the only spurs to Navajo raiding. By the early nineteenth century, great differences in wealth divided

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Navajo families and forced the poor to raid. Since early times, Navajos seem to have been organized economically and politically into self-sufficient local groups, each made up of perhaps a few dozen families. Every group had a "headman," who probably settled disputes within the group and acted as its spokesperson to outsiders such as colonial authorities, missionaries, and the like. These headmen were probably chosen by group consensus and exerted "moral suasion" rather than power over their followers (Hill 1940a, b; Reeve 1958). Evidence that these headmen were also wealthy was lacking until the late eighteenth century, when Antonio El Pinto, a headman from the Mount Taylor vicinity, was recognized as such (Correll 1979, Vol. 1:80; Reeve 1960:222). That Navajos around Mount Taylor traded rather extensively with both the Spanish and the Pueblo Indians (Reeve 1960:213) and thus had an incentive to amass wealth suggests that wealth stratification was starting, perhaps encouraged by trade.

After 1800, the Louisiana Purchase and the opening of the Santa Fe Trail inundated the New Mexico Territory with trade goods, much of which flowed into the Indian trade (McNitt 1962:14–17). Unlike earlier documents, those of the nineteenth century portray many headmen as owners of large herds of livestock (Correll 1979; McNitt 1972; Reeve 1957, 1958, 1960, 1971). These *ricos* may have controlled the best range at the expense of their poorer neighbors, *pobres* or *pelados*, who could either become semidependent retainers of the *ricos* or colonize new land and enlarge their herds through raiding.

Narbona of Sheep Springs, on the east side of the Chuskas, perhaps epitomized the *rico*. He had three wives and presided over a sprawling menage in which his first wife's mother cared for almost a dozen children. The family owned 2000 sheep, 200 goats, 50 head of cattle, and 200 horses. The sheep and goats were divided into several flocks, each in the care of two or three herders, while the other herders looked after the horses and cattle. Narbona owned a few slaves (non-Navajo captives taken on raids), but most of the herders were indigent genealogical or clan relatives who worked in exchange for safety and board for themselves and their families. Of the various dependents, the older women wove and the older men made moccasins, saddles, and silver jewelry. Narbona's own homesite consisted of a hogan for each of his wives, one for his mother-in-law, one for a married daughter, and one for his aunt, as well as a corral built against a sheltering cliff and two sweathouses (small bathing chambers that people heated with rocks and then entered to bathe by sweating), one for women and one for men, dug into the bank of an arroyo nearby. Other corrals dotted the range, as the sheep numbered too many for herders to bring them home every night. Dependents evidently maintained their own homesites some distance from that of Narbona (Newcomb 1964:8–9).

The growing herds of *ricos* like Narbona perhaps forced not only *pobres*, but also the ambitious children of *ricos*, to colonize new land, most of which was to the west.

Perhaps as a result, and also because military campaigns had become "at least an annual event" for the New Mexico colonial government by about 1834 (Wilson 1967:23), the Black Creek Valley seems to have received another wave of settlers during the 1840s. Spanish and Mexican colonial documents indicate little earlier military interest in the area, although it lay between Zuni and the Chuskas, two frequent military targets (Correll 1976; Wilson 1967). Between 1848 and 1868, however, soldiers saw Navajo cornfields in the Black Creek Canyon spilling into the valley of the Rio Puerco and even farther west in the Pueblo Colorado Wash (Reeve 1974:241).

The people who moved into the Black Creek Valley during the 1840s were the headmen Zarcillos Largos and Manuelito and their followers. This group may have included the ancestors of people who later settled the lease townships. Manuelito had moved to Sheep Springs in 1835 when he married Narbona's daughter, and he apparently had raided with the future headman Ganado Mucho. He had moved south along the foot of the Chuskas toward Tohatchi sometime before Narbona was killed in 1849 during a supposedly peaceful encounter with the U.S. Army (Correll 1979, Vol 1:241–242; Hoffman 1974:83–85). Manuelito had possibly also begun to range from Tohatchi across the Chuskas into the Black Creek Valley. Meanwhile, in 1843, Zarcillos Largos and several other headmen notified Mexican colonial officials that they wanted to settle in the Zuni Mountains, at Bear Spring, and in the Chuskas to separate themselves from the "thieves of the tribe" (Correll 1976:151). That these thieves probably emanated from the eastern Navajo

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country near the Spanish settlements suggests that Zarcillos Largos, too, then lived in the eastern Navajo country.

When the U.S. Army moved into the Black Creek Valley in 1851, however, these men and their followers seem to have already ensconced themselves there. Partly to protect travelers to California from the Navajos, Colonel Edwin Vose Sumner established the first military post inside the Navajo country, Fort Defiance, where Bonito Canyon enters Black Creek about 10 miles northwest of the lease townships (Correll 1976:262–263). Some of the soldiers called the place Hell's Gate (Frink 1968:19), but, according to another contemporary observer, "The location is one of the most eligible ones that can be found in all that region, being at the mouth of *Canoncito bonito* (pretty little canyon), a favorite spot with the Navajos, and near fertile valleys and good water" (Davis 1962:229). Relations between the army, on the one hand, and Manuelito and Zarcillos Largos, on the other, seem to have been uneasy at first and deteriorated thereafter.

In 1853, Territorial Governor David Meriwether designated Zarcillos Largos "head chief" of the Navajos (Correll 1976:322). In the fall of 1854 the civilian Navajo Agent Henry L. Dodge, or Red Shirt, as the Navajos called him, made Fort Defiance his headquarters. For the next year he circulated among that post, Red Lake in the upper Black Creek Valley, and Washington Pass on the trail over the Chuskas to Sheep Springs (McNitt 1972:256, 267). He had reportedly married a niece of Zarcillos Largos (Brugge 1970:12) and was apparently moving within the area that his wife's family used. In July of 1855, Governor Meriwether went to Red Lake, a "pretty little sheet of water among the mountains," where he met with many Navajo headmen to negotiate a boundary for the Navajo territory (Davis 1962:231). At this council, Zarcillos Largos renounced his office as spokesman for the Navajos, and the honor passed to Manuelito. The description of the treaty council by Meriwether's secretary, W. W. H. Davis, reveals the uneasy tone of relations between the Navajos and their would-be colonizers.

> When we returned to our camp we found it surrounded by hundreds of Indians, and some dozen or more greasy fellows were occupying our tent, and smoking in a manner ridiculously cool and independent, but they soon made tracks after our arrival. . . . In the evening there was a rumor in camp that the bad men of the tribe intended to attack us during the night, but we viewed it as an idle tale. (Davis 1962:233)

After the chiefs had agreed to the treaty, Meriwether presented them with a wagon-load of gifts. These they distributed among the 2000 buckskin-clad warriors present by throwing them "into the crowd pell-mell. . . . Brass kettles, knives, tobacco, muslin, looking glasses, and various other articles changed owners with magic quickness" (Davis 1962:235).

Notwithstanding this treaty (never ratified by Congress), conflicts between the garrison at Fort Defiance and the local Navajos soon flared. The resulting military observations offer glimpses of the seasonal moves of Manuelito, Zarcillos Largos, and their followers in and out of the Black Creek Valley. Like Narbona, these headmen seem to have dominated large tracts of range; their followers must have herded in the same general areas.

In 1856, for example, Zarcillos Largos was said to have kept a winter home in Oak Springs and a summer home and farm upstream at Red Lake. He also controlled the lush high pastures in the mountains northwest of Fort Defiance, which his brother leased to the army in exchange for gifts and bonuses. In the same year, agent Dodge was confronted by Manuelito, in whose cattle range around Red Lake the soldiers were cutting hay for army livestock (Correll 1979, Vol. 2:44, 100; McNitt 1972:284, 304). Like Zarcillos Largos, Manuelito probably used this range in summer, for he was known to spend the winter far to the southwest in the low-lying open grasslands of the Pueblo Colorado Wash, a range that he apparently shared with Ganado Mucho (Correll 1979, Vol 2:177, 182, 187; Hoffman 1974:91).

In May of 1858, soldiers from Fort Defiance killed 48 of Manuelito's cattle north of Fort Defiance. Apparently in retaliation, a Navajo killed the black slave of the officer in command of Fort Defiance, and the foes plunged into a full-scale war with many engagements in the Black Creek Valley near the lease townships (Correll 1979, Vol. 2:122–131, 133–134, 153–154). An army company skirmished with Navajos at Oak Springs, capturing at least 20 people, including Torrivio, a Hispanic slave of the Navajo headman Herrero, after whom Torrivio Ridge (or Mexican Fall Down Hill, according to local people)

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in the lease townships may have been named (Correll 1979, Vol. 2:188–189). In the fall of 1858, a contingent from Fort Defiance went to the Pueblo Colorado Wash, where Zuni auxiliaries burned "Manuelito's village" of "wigwams or half cabins" (Correll 1979, Vol. 2:182). Another contingent, dispatched to attack Zarcillos Largos and destroy his "rancheria," failed to find him near either Oak Springs or Red Lake. They finally caught him and his followers at the wheatfields about 10 miles north of Red Lake, where they wounded the headman and took more than 50 horses, many buffalo robes, blankets, saddles, a silver belt, and an opulent coral necklace (Correll 1979, Vol. 2:169–170). Zarcillos Largos survived but was killed 2 years later far to the southwest near Klagetoh, supposedly by New Mexican and Zuni raiders (Correll 1979, Vol. 3:86).

In July of 1858, an army detachment sent to reconnoiter the Navajo country reported a few people in the Black Creek Valley but no livestock. They observed "extensive" cornfields totaling about a 100 acres in the lower valley and about 15 or 20 miles north of there, possibly between the present St. Michaels and Fort Defiance. They saw evidence of "wintering large herds of horses and flocks of sheep" in the lower Black Creek Valley, which they said was too dry for grazing before mid- July. They also noted cornfields, but no stock or people, in Manuelito's winter range on the Pueblo Colorado Wash. On the other hand, they found Red Lake "swarming" with horses and sheep, which they thought people had driven there "by their fear of the Utahs" (Walker and Shepherd 1964:63–64).

Between 1859 and 1861, army scouting parties often led by Ute and New Mexican trackers harassed Navajos in the valley of the Rio Puerco of the West and the Chuskas (Bailey 1964:135; Correll 1979, Vol. 3:98, 100; Jenkins 1980:89–91). Navajos attacked soldiers at a grazing camp in the Cienega Amarilla (now St. Michaels) a few miles south of Fort Defiance in January of 1860 (McNitt 1972:380–381). In April, a force variously reported as 100 to 1000 Navajos under Manuelito and the Canyon de Chelly headman Barboncito attacked Fort Defiance (Correll 1979, Vol. 2:386–393). The attack failed, and later in the year the army established another post, Fort Fauntleroy, near the Puerco about 40 miles southeast of Fort Defiance. Stretched thin after the outbreak of the Civil War, however, the army abandoned Fort Defiance early in 1861. Manuelito immediately moved in with his cattle (Hoffman 1974:91). Later in the year the army also abandoned Fort Fauntleroy (renamed Fort Lyon after its original namesake joined the Confederate Army) after a horse race ended with troops massacring Navajos who had gathered there to receive food rations (Correll 1979, Vol. 3:183–184).

The swirl of events in the Black Creek Valley seems, however, to have bypassed the lease townships completely, as archaeological evidence of Navajo occupation remains absent (Eck, Boyer, and Kelley 1982). If people used the lease townships at all, they probably still confined themselves to hunting and gathering, although Torrivio and his companions may have hidden near the ridge perhaps named after him.

Navajos may also have avoided the lease townships for another reason. In 1853 the army built the wagon road from Fort Defiance through Wingate Valley to Albuquerque (see Figure 3.2), and during the rest of the decade a constant traffic of military expeditions, supply trains, and the like crossed the townships (Frazer 1963:22; Jenkins 1980:44–45; U.S. Department of the Interior [USDI] General Land Office 1882, 1893).

When military activity escalated into warfare after 1858, the military road would have made the lease townships especially unattractive. The abandonment of Fort Defiance would have offered little rest to Navajos nearby, for between 1860 and 1868 many "citizens' expeditions," with the tacit consent of the U.S. government, raided the Navajo country for slaves (Brugge 1972:103). Military observers nevertheless reported Navajos along the wagon road near Rock Springs only a few miles east of the townships in 1858 and 1861 (Littell 1967:229, 232).

The final blow came in the summer of 1863, after General George S. Carleton's troops had secured New Mexico for the Union. Carleton dispatched his troops to Fort Defiance under Kit Carson, who unleashed them and his Ute mercenaries on the Navajos. Carleton apparently believed that the Navajo country concealed rich deposits of gold and silver, in which he hoped to speculate after he had removed the Navajos to make the land safe for mining (Young 1978:33). First Carson had the Utes destroy all fields within a 40-mile radius of Fort Defiance, or an estimated 2 million pounds of grain (Bailey 1964:156; Kelly 1970:38–44). Navajos battled with the army at China Springs, about 10 miles southeast of the lease townships (Van Valkenburgh 1941:63). Throughout the fall and winter of 1863 to 1864, Carson's men continued

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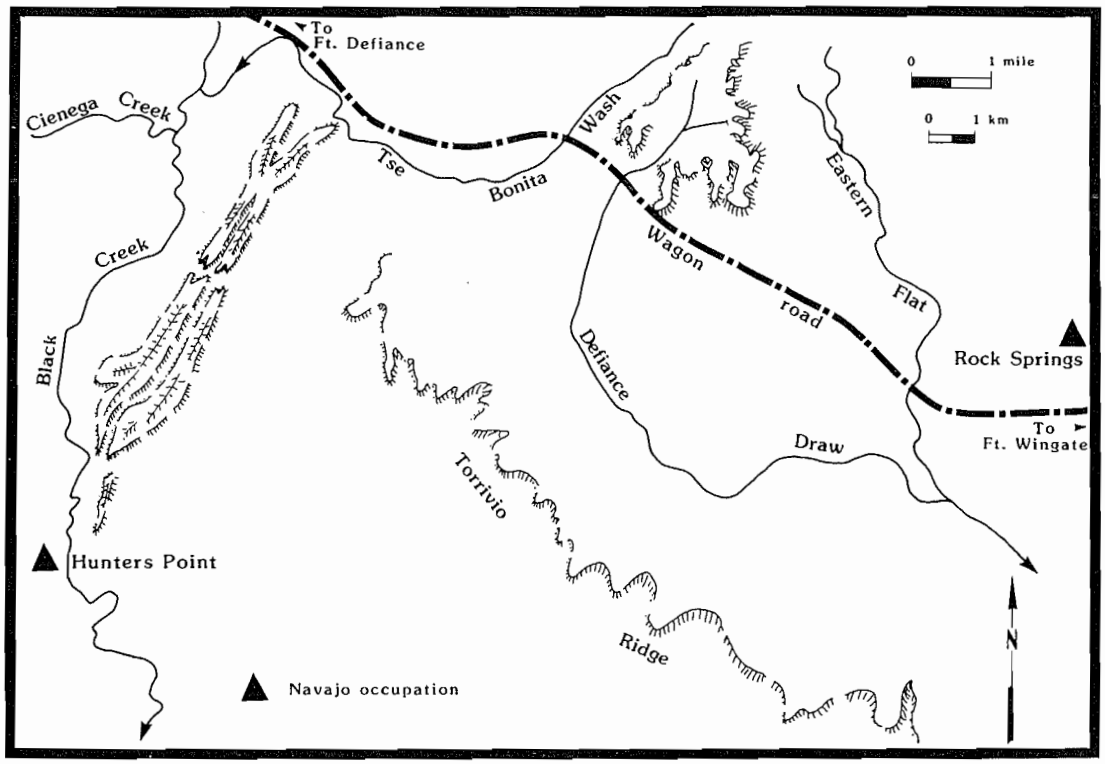

Figure 3.2 The landscape of the lease townships in the 1850s.

to destroy fields and any livestock that they encountered. Carson also asked Carleton to let his Ute mercenaries take Navajos as slaves (Kelly 1970:30–31). These depredations forced Navajos to surrender to Carson at Fort Defiance. During the spring of 1864, groups of 1000 to 2500 people with their remaining livestock began the Long Walk to Fort Sumner in eastern New Mexico, presumably along the military road that crossed the lease townships (Correll 1979, Vol. 4).

1864–1881

While many Navajos languished at Fort Sumner, those who stayed behind fled to the edges of the Navajo country and beyond. The neighborhood of the Black Creek Valley and the lease townships probably was deserted most, but not all, of the time. "Roaming bands who had eluded the troops and scouts of Carson burned the cane and timbered sections of [Fort Defiance], leaving only the thick sod and rubble walls" (Van Valkenburgh 1941:57). In the spring of 1864, Manuelito was reported around Oak Springs and Fort Defiance, together with several other headmen and 1200 followers. Manuelito refused to surrender, reportedly because he expected a massacre at Fort Sumner like the one at Fort Fauntleroy 3 years earlier (Correll 1979, Vol. 4:167–168). The next winter, Manuelito again told emissaries that he would not surrender but would plant crops in the Canyon Bonito. He did, however, reveal the locations of other Navajos, including 40 of them at Oak Springs (Reeve 1974:334).

In the summer of 1865, however, Manuelito with his band of 100, including 25 warriors, had fled 60 miles south of Zuni (Ellis 1974:456). By the summer of 1866, Manuelito was hiding in the Sierra del

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Escudilla near present-day Springerville, Arizona. The following September, Manuelito and his followers finally surrendered. They were the last band to turn themselves in (Correll 1979, Vol. 5:368).

Manuelito and his followers remained at Fort Sumner until July of 1868. By that time, the U.S. government had found that the Navajos could not support themselves by farming at Fort Sumner as they could by herding and farming in their homeland. The government therefore established a reservation in the middle of the Navajo country by a treaty that Manuelito and other headmen signed (USDI, Commissioner of Indian Affairs 1868:161–164; Correll and Dehiya 1978:2–7). The treaty reservation extended about 30 mi. on either side of the boundary between the Arizona and New Mexico territories, and from the Colorado–Utah line south as far as the line running east and west from Fort Defiance. An executive order annexation moved the southern boundary south to Cienega Amarilla (St. Michaels) in 1880 (Correll and Dehiya 1978:10–11). The lease townships and lower Black Creek Valley, however, remained outside the reservation.

All Navajos were supposed to stay within the boundaries of the treaty reservation, but many Navajos, when they returned from Fort Sumner in 1868, settled outside. The BIA had supposedly refurbished Fort Defiance to serve as the Navajo agency (although 13 years later it was called "a collection of old dilapidated mud, pig sties and sheep pens"), where government agents distributed rations of grain and beef to help the many destitute families (Bloom 1936:81). That farming was also an economic mainstay is clear from the rations that agents issued for many years to compensate for crop failures. The herds regenerated, however, by the middle 1870s, and Navajo dependence on rations apparently diminished (Bloom 1936:82; USDI, Commissioner of Indian Affairs 1868–1881).

The agents also distributed annuity goods, which the 1868 treaty had promised for 10 years. Periodic distributions continued as late as 1891, however, and included 25,000–44,000 sheep and goats in addition to cloth, coats, shirts, boots, hats, pots and pans, kettles, harness, various small tools, sheep shears, plows, hoes, axes, scrapers, wheelbarrows, cookstoves, and even wagons (Brugge 1980:51–72, 118–121; Correll 1979, Vol. 3:224–225; USDI, Census Office 1890:155; USDI, Commissioner of Indian Affairs 1868–1891; Young 1961:146). These distributions induced many more Navajos than had previously lived in the Black Creek Valley to settle there. Probably most of the estimated 1500 Navajos who were subsisting on rations in 1871 (Brugge 1980:58) were living in the general vicinity of Fort Defiance. In comparison, the group of followers of a headman during the mid-nineteenth century may have numbered 10–40 families (Hill 1940a:23). The combined followers of Manuelito and Zarcillos Largos probably would have numbered no more than a few hundred.

Among the people who settled in the Black Creek Valley after Fort Sumner were people who were soon to settle in the lease townships, or the forebears of those settlers. Many may have been followers of Manuelito and Zarcillos Largos before Fort Sumner. Circumstantial evidence is that the clans associated with Manuelito, Zarcillos Largos, and their followers were also common among the lease-township residents of 1910 and their forebears (Kelley 1982a:138). Unfortunately, the available sources are too fragmentary to show whether any direct genealogical ties existed between lease-township residents and the two headmen, although some residents are linked indirectly to Manuelito. One of the first settlers of the lease townships after Fort Sumner, moreover, was born around 1850 near Washington Pass, where Zarcillos Largos's band ranged at the time (Navajo Tribe, CC n.d.b).

The forebears of people who moved into the lease townships, then, may have belonged to the bands of Manuelito and Zarcillos Largos before Fort Sumner and perhaps were resettling their former lands after 1868. Manuelito himself, however, was not among them. After 1868 he moved back to his "old home near Tohatchi, south of Sheep Springs" (Hoffman 1974:100). In 1870, the Fort Defiance agent appointed Manuelito head chief, that is, nominal spokesman, of Navajos in the eastern part of the country, and Ganado Mucho chief of those in the west (Van Valkenburgh 1941:90). Manuelito headed the short-lived "Navajo cavalry" (police) and met with two U.S. presidents. He "received many favors from various agents," including "the earliest windmills and wagons, given in the form of annuities [which] were issued to Manuelito and other favored headmen." He fell from favor in 1884 for drunkenness, however, and died 9 years later (Van Valkenburgh 1941:91).

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Chapter 4

The Railroad Era, 1881–1930

Historical Background

In 1866, while the Navajos were still at Fort Sumner, Congress granted the Atlantic and Pacific Railroad land in the New Mexico and Arizona territories. This grant ultimately included both surface and mineral rights to all the odd-numbered sections in a swath 50 mi. wide on either side of the right-of-way (Greever 1954:20). It created a checkered pattern of land ownership south and east of the Navajo Reservation that has persisted to this day, although with many modifications. Within this so-called checkerboard area, the right-of-way followed the Rio Puerco 10 mi. south of the lease townships. The Atlantic and Pacific Railroad, later called the Atchison, Topeka and Santa Fe (AT&SF), was built in 1881. Its two most important consequences for land use in the lease townships were the commercialization of Navajo family production and the settlement of the lease townships.

The railroad drew a flood of traders, who saw in the Navajo wool an opportunity to profit from the high wool prices of the early 1880s in U.S. markets that the railroad brought within a few days' travel (U.S. Department of the Treasury [USDT], Bureau of Statistics 1901:447). The Navajos, on their part, were ready to trade their wool, for they were still rebuilding their herds from the Fort Sumner fiasco and needed every source of livelihood they could get. If one considers the primitive shearing tools of the time, tin cans and knives, agents' wool-sales figures suggest that Navajos were shearing most of their sheep by 1880 (USDI, Commissioner of Indian Affairs 1880:131). The traders also sold flour and other mass-produced foods that allowed Navajos to lessen their dependence on farming. The Navajos therefore could settle lands not very well suited to agriculture, such as the lease townships.

Before the railroad, the only trading posts near the lease townships were those in Fort Defiance proper (Kelley 1977:251), where Navajos were exchanging wool for consumer goods by 1876 (USDI, Commissioner of Indian Affairs 1876:109), and one nearby just south of the treaty reservation line near Black Rock, operated by Anson Damon and a man named Neale on Damon's homestead. Damon had been a butcher at Fort Defiance who married a Navajo woman and returned to the Navajo country with her (McNitt 1962:249). His sons were soon to play a role in the settlement of the lease townships.

The railroad gave traders access not only to the wool market, but also to markets for the blankets and silver jewelry that Navajos had previously produced mainly for themselves. By 1890, Navajos were substituting clothing of machine-made calico and woolen blankets

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Figure 4.1 Navajo family portrait taken in the west-central reservation in 1892–1893 shows that clothing of machine-made cloth (worn by woman at left and man at right) was replacing home-made clothing (worn by woman second from left and seated woman). Note also the earth-covered, conical dwelling (forked-stick hogan) and sheep bedded without a corral in the background. (Photograph from Smithsonian Institution, National Anthropological Archives, Bureau of American Ethnology Collection).

for their own leatherwork and weaving and were trading a large share of their woven goods (see Figure 4.1). In that year, the Fort Defiance agent reported to the Commissioner of Indian Affairs,

> The proximity of trading posts has radically changed their native costumes and modified many of the earlier barbaric traits, and also affords them good markets for their wool, peltry, woven fabrics, and other products. Bright calicoes and Mexican straw hats are their ordinary summer attire, and they take kindly to our comfortable heavy garments in cold weather. . . . Silver ornaments of their own manufacture are worn instead of copper or brass. (USDI, Commissioner of Indian Affairs 1890:164)

Falling wool prices spurred this transition, as both weavers and traders could make more money per pound of wool in the form of blankets than in the raw (Amsden 1934:235; Mindeleff 1898:503). By 1914, the Fred Harvey Company, which ran the dining car concession on the AT&SF Railroad and tourist hotels along the way, was to build up "the largest business in Indian blankets, baskets, pottery, and curios in the

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world" (James 1914:203). The company also launched the commercial production of silver jewelry in 1899, when its representative, Herman Switzer, asked traders to have local smiths make souvenir baubles for railroad tourists (Adair 1944:25–56; Bedinger 1973:118).

On the other hand, sales of sheep, especially of the lamb crop, seem to have been low until the 1920s (Coolidge and Coolidge 1930:69; Harbison 1932:9190; Kelly 1968:113). Agents' reports before 1907, when detailed reports by reservation ceased, mention lamb sales in 1890 only (USDI, Commission of Indian Affairs 1890:162). The reason for the low sales probably was not the lack of a market, for lambs from elsewhere in New Mexico were going to feedlots in the Midwest by the 1890s (Carlson 1969:34; Grubbs 1961:284–285; Kelly 1972:192; Parish 1961:121), and off-reservation feeders were buying Navajo lambs from the traders by late in the railroad era. The government, however, required these buyers to arrange purchases from reservation traders by way of the government agents, who opposed such sales as long as there were Navajos whose lack of stock forced them onto government rations (USDI, Commissioner of Indian Affairs 1905:268; U.S. Senate 1932:9520–9817). Most Navajo families, moreover, were themselves unwilling to sell stock, because they were still trying to build up their herds, and because they ate the surplus animals (male lambs and old, unproductive sheep). They would especially have avoided selling when prices were low around the turn of the century and after World War I (Kelly 1968:113; New Mexico Department of Agriculture [NMDA] 1962:44–45), for the use values of sheep consumed would exceed the exchange values.

As Navajo households began to produce wool and handicrafts for the market, their burden of labor seems to have grown. Even before Fort Sumner, Navajos had marketed some handicrafts; Navajo blankets were traded as far as Saltillo, San Miguel, and Oaxaca, Mexico. Nevertheless, the volume of all craft production except weaving was probably low, and even weaving was mainly for home use (Amsden 1934:133; Matthews 1883; Mera 1947:2). After the railroad opened new markets for handicrafts, however, Navajo families greatly increased their weaving and silverwork. The added labor would have been only partly offset by the possible decline in farming and the labor-saving methods, such as the substitution of cotton string for homespun warp, which weavers used during the 1890s until the traders found that the cheapened product was not as marketable (Amsden 1934:193).

The volume of weaving in the Navajo country surged during the 1890s, when almost the entire output went to the traders. The estimated value of all Navajo blankets and rugs sold, $24,000 in 1890, more than doubled by 1899 and reached $719,000 by 1911, after which it leveled off (Amsden 1934:182; James 1914:57; USDI, Commission of Indian Affairs 1890:162, 1899:157). Commercial silversmithing evidently did not flourish quite so early, but reached "tremendous proportions" by the 1920s in Gallup and the Navajo communities near the railroad (Adair 1944:9, 28). Because this rapid growth in handicraft production probably was not offset by any great reduction in other demands on family labor, the family's labor burden probably grew. From the very beginning, this trade affected the lease townships. During the 1880s, new stores appeared at Manuelito, Rock Springs, and Cienega Amarilla, (St. Michaels), all within a few miles of the lease townships (Amsden 1934:178; McNitt 1962:49; Van Valkenburgh 1941:90).

The railroad also attracted homesteaders to the public domain that alternated with the railroad sections in the Black Creek Valley outside the reservation, even though Navajos were already living there. That white settlers eschewed the lease townships is probably owing to the lack of reliable water. They did, however, settle nearby at Cienega Amarilla, where two reliable streams come together. Sam E. Day, who had worked on a survey of the northern part of the railroad grant in 1885 and had hauled supplies for the agency at Fort Defiance, staked the first claim in the Cienega Amarilla, where he raised a cabin in 1887. The Navajo named Shorthair, who was already pasturing his stock in the meadow, tried to drive Day out, but Day coopted Shorthair by paying him and nine other men $1.50 a day to help fence the meadow (Wilkin 1955:24). The next year, Joe Wilkin and J. M. Wyant jointly settled two quarter-sections in the Cienega Amarilla and started to trade there. These and other homesteaders soon sold out to the Sisters of the Blessed Sacrament of Philadelphia and the Franciscan Fathers of Cincinnati, who established the St. Michaels Mission in 1898 and gave the Cienega Amarilla the

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new name of St. Michaels (Wilkin 1955:22–85). All of these settlers played a role in the first settlement of the lease townships.

Meanwhile, other settlers were moving into the Puerco Valley. In 1881, coal mines to supply the railroad drew the first settlers to Gallup, a railroad stop 15 mi. southeast of the lease townships. By 1890, the number of mines had so proliferated that the settlement became a railroad division point and major regional freight depot (Van Valkenburgh 1941:63). By the turn of the century, it had also become a major wholesaling center for the trading posts (McNitt 1962:222–223).

Between 1881 and 1890, the trader–homesteaders in the Black Creek Valley and the settlers of Gallup may have pushed some Navajos into different parts of the lease townships. The first person to move into the Tse Bonita Wash was reportedly Tall Salt Clansman of St. Michaels, a brother of Shorthair. He was a large-scale stock owner whose claim seems to date to the 1880s. The first settlers of the middle Defiance Draw were Smiley and his wife, both of Hunters Point, who moved in a few years after they were married around 1875 (Franciscan Friars n.d.b). The first identifiable users of the Eastern Flat were a group of related women of the Towering House clan and their husbands. After returning from Fort Sumner, this family evidently settled along the Puerco around the future site of Gallup. Some may have lived around Catalpa Canyon in the hills south of Gallup (York 1981); others settled westward around Tsayatoh north of the Puerco; still others moved northward, probably up the Defiance Draw, possibly to Rock Springs and into the lease townships. When this movement began is unclear, but surely the development of Gallup propelled it, especially the opening of coal mines around Defiance and Mentmore near the mouth of Defiance Draw in 1881 (USDI, General Land Office 1881) and in Catalpa Canyon in 1887 (Moore 1981:24).

All these original settlers of the lease townships had herds somewhat larger than average and claimed the biggest sage flats in the bottoms of the three major drainages. They used this land mainly in winter. Figure 4.2 shows the approximate locations of the original claims. These settlers returned to Black Creek and the Puerco in the summer.

Another consequence of the railroad and trade also affected the settlement of the lease townships. During the early years of the railroad era, a class of wealthy Navajos who raised livestock for profit began to form in the Black Creek Valley. Evidence from the vicinity of Chaco Canyon (U.S. Senate 1937:18004) suggests that the men who ran this type of operation were often in debt to the traders who equipped them. This class may have included headmen with family prestige and herds accumulated before Fort Sumner, but also men who had amassed herds through entrepreneurship. Some were mixed-bloods whose knowledge of English gave them an advantage.

Tall Salt Clansman's brother-in-law, Silversmith, though not a mixed-blood, was such a rich man. He moved between his own lands around Crystal in the upper Black Creek Valley and those of his wives in St. Michaels. Together with the homesteaders, he may have forced Tall Salt Clansman from St. Michaels into the lease townships. The epitome of the new *ricos*, however, was Chee Dodge. The son of a Navajo woman and the Hispanic captive–army interpreter Juan Anaya (Borgman 1948:83), or a white army officer, or agent Henry L. Dodge himself (McNitt 1972:295), Chee Dodge learned to speak English at Fort Sumner and returned to Fort Defiance with his mother's sister and her husband, a white supply clerk at the post. Agent Arny hired Chee Dodge as the agency interpreter in 1874 or 1875, and in 1884 Dodge replaced Manuelito as "head chief." (Ganado Mucho apparently had earlier fallen by the wayside.) In the same year, Dodge bought an interest in a northern reservation trading post (USDI, Census Office 1890:156; Van Valkenburgh 1941:90, 127). By the late 1880s, Dodge had reportedly saved thousands of dollars (Hoffman 1974:187–198).

Dodge evidently started running livestock in 1886 (Borgmann 1948). He had several large ranches, including one in the upper Black Creek Valley near Sonsela Buttes, where the range is among the best in the Navajo country (Hoffman 1974:187–198; USDI, BIA, Eastern Navajo Agency n.d.b; USDI, BIA, Fort Defiance Agency n.d.). In 1895 he hired a German architect from Flagstaff to build a big stone house near Sonsela Buttes, in one wing of which he opened a store to provision the herders whom he hired. He also married a woman from Sawmill and therefore may have run stock there as well (Hoffman 1974:187–198). According to the 1915 census of the Fort Defiance Agency, or Southern Navajo Agency jurisdiction

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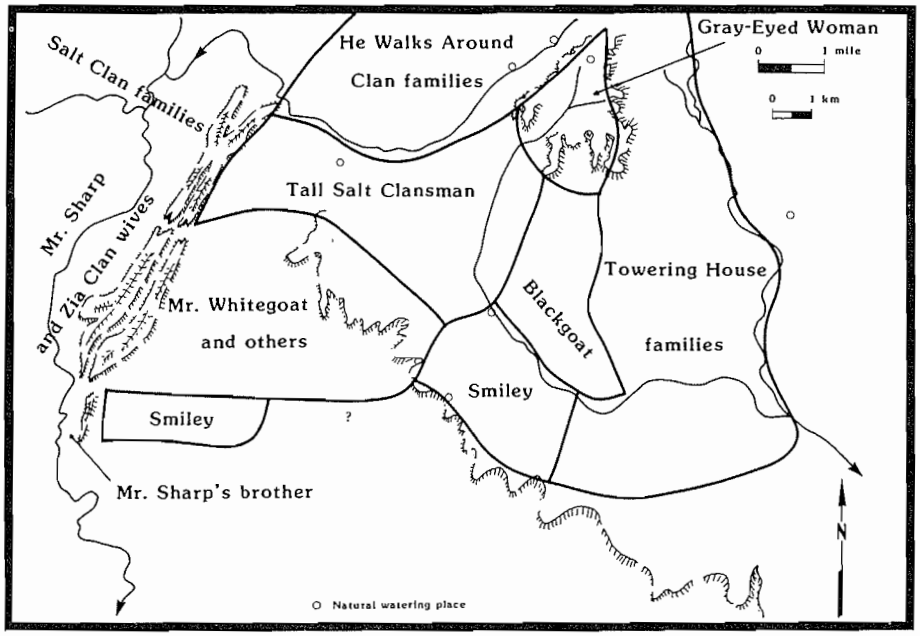

Figure 4.2 Original claims in the lease townships, ca. 1880–1900.

(Paquette 1915), he was running 5000 sheep and over 1000 cattle—figures that may reflect only his holdings on the reservation. He is undoubtedly the unnamed Navajo who, according to the same source, maintained a bank deposit larger than any in McKinley County, New Mexico, except for those of the Gallup coal companies. When the federal government was to organize the first Navajo Tribal Council in 1923, Chee Dodge would be its chairman.

Other wealthy stock owners who had also worked for the agency and were probably running stock in the lush pastures around Sawmill were Anson Damon and his sons. The 1915 census enumerated the sons at Sawmill, where two of them had combined holdings of 3600 sheep and goats; they had probably been using the land earlier along with their father's homestead south of Fort Defiance.

Between 1890 and 1900, the expanding herds of Chee Dodge and the Damons seem to have pushed a second wave of Navajo settlers into the lease townships. Unlike the first wave, these settlers came from the vicinity of Fort Defiance and, according to local Navajos, claimed the rocky upland portions of the upper Tse Bonita Wash and upper and middle Defiance Draw. All were neighbors and relatives or in-laws of Chee Dodge and the Damon brothers (Franciscan Friars n.d.b). Thus, Louis Reeder, Old Man Curly and other He Walks Around clan people, and a man who may have been Lefthanded Slim settled along the upper Tse Bonita Wash. Louis Reeder and Old Man Curly had married women related to Chee Dodge; Old Man Curly's older wife was also a half-sister of Lefthanded Slim. Old Man Curly and Lefthanded Slim came from Natural Bridge near Fort Defiance, the home of the Damons; descendants of a He Walks Around clan settler say that the people moved because the land had become too crowded. Blackgoat, another refugee from Fort Defiance, married a daughter of Smiley in 1895 and herded from his father-in-law's claim northward across the Defiance Draw. Blackgoat's father was a neighbor and possible relative of the Damons; Blackgoat also had a wealthy younger brother, who may have crowded him off the family's land at Red Lake.

Meanwhile, beyond the Black Creek Valley and its neighboring lands, homesteaders and cattlemen were

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settling throughout the checkerboard area at the same time that Navajos were intensifying their use of those lands. Clashes between the Navajo and non-Navajo stockmen reached peak ferocity during periods of high livestock and wool prices (Brugge 1980:191–243; NMDA 1962:44–45, 56). In 1906, therefore, after 4 years of pressure from the Indian Rights Association, from Father Anselm Weber of the Franciscan Friars in St. Michaels and from others, the BIA took advantage of a slump in the cattle market to authorize the allotment of Navajos on the public domain, including land that alternated with railroad sections. Tracts around water were the first ones allotted (Brugge 1980:204; Tyler 1973:97; USDI, Commissioner of Indian Affairs 1888:191; Weber 1937:17571; Wilkin 1955:199–206). Federal policy there was to grant allotments not only to male heads of households, but also to their wives and all minor children then living (U.S. Senate 1944:3093).

To ease the allotment process, President Theodore Roosevelt in 1907 withdrew from the public domain a large portion of the nonrailroad lands that Navajos occupied in New Mexico and Arizona until all Navajos living on these lands could receive allotments (Brugge 1980:204; Correll and Dehiya 1978:24–29). This area included the lease townships. After allotting some land in the middle Black Creek Valley (including allotments to a few lease-township residents), the government took the railroad land there in exchange for public domain outside the Navajo country and annexed the middle Black Creek Valley to the reservation (Correll and Dehiya 1978:24–29; Greever 1954:86). In New Mexico, however, the railroad kept its lands. Moreover, the large-scale commercial non-Navajo sheep owners, who also used the checkerboard area, were still enjoying high prices and competing intensely for range, and their protests forced the federal government to restore the withdrawn land to the public domain between 1908 and 1911 (Brugge 1980:191–243; Correll and Dehiya 1978:24–20; NMDA 1962:44–45).

Almost all of the public domain in the lease townships was allotted in 1910 (see Figure 4.3), but the allotments were not trust-patented until 1921, possibly because the agent who had taken the applications between Thoreau, New Mexico, and the Arizona line had neglected to file them at the local land office (Kelly 1968:34–35). The federal government retained the rights to coal under these allotments, and thus at any time could sell the coal out from under the allottees and their descendants, displacing them without their consent.[1] For this reason, lease-townships residents can be said to have lived "in the shadow of the dragline" since the time of the allotments.

Having concerned itself with Navajo land rights in the checkerboard area, in 1909 the BIA also established a special agency for that area. This was the last of six agency jurisdictions into which the government had begun to divide the Navajo country around the turn of the century, when successive additions to the reservation had consolidated an area too big for the Fort Defiance agent to administer alone (Young 1978:49–51). The lease townships, although located in the checkerboard area, were nearer to Fort Defiance and therefore included in that jurisdiction (Paquette 1915). They did not come under the jurisdiction of Crownpoint until about 1940. After 1911, lease-township residents were thus moving seasonally between lands on and off the reservation but remaining within one agency jurisdiction.

The agency superintendents, as the agents were now called, often remained aloof from their wards. This aloofness exacerbated another consequence of the railroad and trade, the political weakening of the headmen. The councils of local headmen that the Fort Defiance agents had convened periodically after 1868 had become rare by the 1890s (USDI, Commissioner of Indian Affairs 1870–1897). Wealthy headmen still existed, but trading-post credit probably had undermined the economic source of their local authority, largess to their neighbors, especially after the agents refused to continue distributing annuities through the headmen in the 1870s. The first lease-township settlers probably had heard from the agents through headmen in the settlers' original homes outside the lease townships. These headmen had included Silversmith and perhaps one lease-township resident, Charley Boyd, who had served as a scout in the Apache Wars of 1886 (Navajo Tribe, CC n.d.b). By the early twentieth century, however, the new agency superintendents tended to communicate with local people through schools, traders, missionaries, and a few government

[1]Allotment holders have recently sued the U.S. government for the rights to this coal on the ground that the government had no legal basis to reserve the coal in the first place (Snyder and Fyfe 1983).

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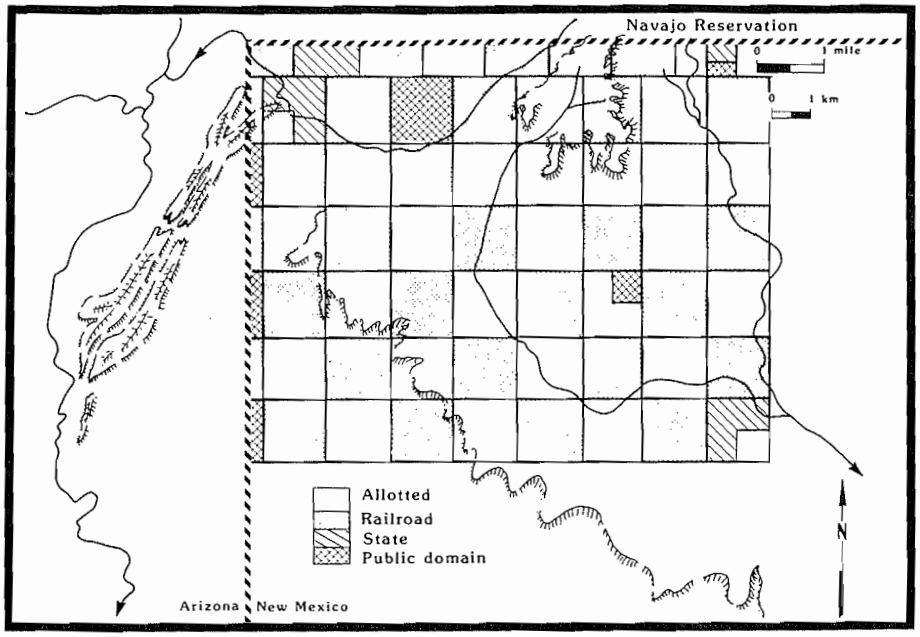

Figure 4.3 Land ownership in the lease townships by 1912.

extension workers, the so-called agency farmers and field matrons, who themselves had ties to traders and missionaries. Lease-township residents probably had more contact with the government through sending their children to the Fort Defiance boarding school, as a very few families did, than through the other channels.

In contrast, lease-township Navajos probably came in contact with traders regularly and increasingly during the early twentieth century as new trading posts began to encircle the lease townships (McNitt 1962:246n, 352; Van Valkenburgh 1941:89–90). The price of western wool in Boston, depressed between the late 1880s and the turn of the century (U.S. Department of Agriculture [USDA] 1910, 1930), had discouraged would-be traders but was now rising again. The growth of wholesaling in Gallup may also have drawn some traders to the countryside nearby. The high wool prices of World War I hastened commercial development even more. By the end of this second influx of traders, the residents of the lease townships were inextricably involved in producing for national markets.

Trends in Family Land Use

During the railroad era, then, the opening of the Navajo country to national markets drew non-Navajo traders and homesteaders and created a class of rich Navajo stock owners, all of whom crowded small stock owners from the Black Creek and Puerco valleys into the lease townships. The federal government and merchant capital also stamped out the vestiges of the old Navajo self-sufficient economy. The process had begun with Kit Carson's destruction of the herds. It continued as agents and traders undermined the political authority and economic responsibility of the rich headmen that had previously bound Navajo families into interdependent, self-supporting communities. The virtual autonomy of Navajo families as units of production, which had weakened community cohesiveness even before Fort Sumner, also kept such communities from reviving. The many livestock-poor households therefore turned for help in hard times to trading-post credit rather than to their wealthier neighbors, and their consequent indebtedness forced them to produce partly for the market. The rich

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Table 4.1
Comparison of Navajo Wool and U.S. Flour Prices, 1890–1974[a]

Year	U.S. flour price (cents/lb)	Navajo wool price (cents/lb)	Ratio of wool price to flour price
1890	2.8	9	3.2
1900	2.4	10	4.2
1910	3.5	13	3.7
1920	8.1	28	3.5
1930	4.6	13	2.8
1940	4.5	22	4.9
1946	7.1	30	4.2
1951	10.4	39	3.8
1956	10.8	31	2.8
1974	20.5	30	1.5

[a]From USDC, Bureau of Foreign and Domestic Commerce 1913:502; 1916:556; 1926:324; 1936:308; USDC Bureau of the Census 1961:339; 1975:349; McNitt 1962:81, 196; James 1914:57; U.S. Senate 1932:8962, 8967, 9198, 9560, 9686; Young 1958:376–377; Kelley 1977:249.

also turned to market production so that they could get all sorts of mass-produced goods and even make profits.

Like all merchants, traders maximized their own profits by buying commodities from their customers at low prices and selling mass-produced goods to the same customers at high prices. As a result, the terms of trade for Navajo households deteriorated in the long run (see Table 4.1), although short-term fluctuations in national markets interrupted the general trend. The individual Navajo household was therefore under almost constant pressure both to increase and to diversify its production, particularly during the early railroad era, after wool prices fell.

The effects of this pressure on each aspect of land use, as I show in the next few chapters, were as follows. The pressure to pay their trading post debts (and the possibility of getting more goods and even profits, in some instances) induced families to raise more stock. If that was not enough, they also produced rugs and jewelry for trade. The more time families spent producing for the market, the more mass-produced foods and other items they substituted for the crops they no longer had time to grow or the handicrafts they no longer had time to make for themselves or for exchange with other families. Those who had been crowded into range without summer water, like the lease townships, were further discouraged from farming.

The pressure on families to increase market production also allowed them to survive on marginal range and to colonize more of it, because they no longer needed to farm. Grazing, however, altered the natural environment. As both human and animal populations grew, people colonized more and more land until finally the range was filled. But population growth did not stop, and families continued to depend on livestock production or even expand it, because neither the merchants nor the government offered a nonland-based alternative (wage work), and the demand for handicrafts was too low to support most families. The land consequently became overgrazed and erosion set in.

The pressure on households to produce for the market may have even quickened population growth. Couples may have wanted many children to help them with the diverse productive and domestic tasks that scattered household members from the home to the stock range, the cornfield, the fuelwood grove, and the watering place. Households headed by very young or old people often lacked enough able-bodied members to do all this work. The households of the young and old therefore tended to pair up, sharing a homesite, herd, and labor.

The market orientation of individual households, together with its corollary, the decay of the self-sufficient community, also almost eliminated communal land tenure, the pre–Fort Sumner form. The dominant form of land tenure instead became that of

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households, singly or in small groups, through original claim or inheritance. A vestige of communal tenure survived, however, in the outfit, as land competition, drought, and range erosion forced many households to seek new land, at least temporarily, at the same time that federal law made both reservation and allotted land unavailable for them to lease or buy.

The pressure on households to produce more for the market also altered the spatial aspects of land use: the number, size, and distribution across the landscape of grazing tracts, fields, and homesites. As market production encouraged families to produce more livestock, they not only filled, but subdivided, the range, both inside and outside the lease townships. Inside the lease townships, the growing number of families partitioned the range into more tracts, which were necessarily smaller on the average and encompassed fewer types of natural resources, especially water. As the same families partitioned their summer range outside the lease townships, some households lost access to the summer range and began to stay in the lease townships all year. As a result, even though most households farmed less than their predecessors had before Fort Sumner, a growing number of households planted fields in the lease townships, and there the number of fields increased. The number of homesites overall may have grown with population, but the number that each family used probably dwindled. As families filled and subdivided the range, they did not need so many homesites to exploit fully the shrinking tracts. As they consequently settled down longer on each homesite, people engaged in a wider range of activities there, especially weaving, and stored more things. To encompass all this they needed bigger dwellings and more facilities, and their homesites thus grew in size and complexity. Homesites also proliferated in the most marginal range after the better, neighboring range filled up.

Finally, the pressure on households to increase market production shows in domestic, herding, and farming technology. Families responded directly to this pressure by changing the forms and sizes of their dwellings to accommodate more handicraft production, and by adopting as many new labor-saving tools, techniques, facilities, and equipment as they could afford. Families also altered technology (or at least its appearance in the archaeological record), because they settled down longer on each homesite; they built bigger houses and a wider variety of facilities and discarded more varied things on each site.

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